

Scanning - Shortwave - Ham Radio - Equipment  
Internet Streaming - Computers - Antique Radio



# Monitoring Times-

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July 2008

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# Monitoring Montgomery



## *Also in this issue:*

**Scanning Lake Lanier**

**Reliving WW II via Radio**

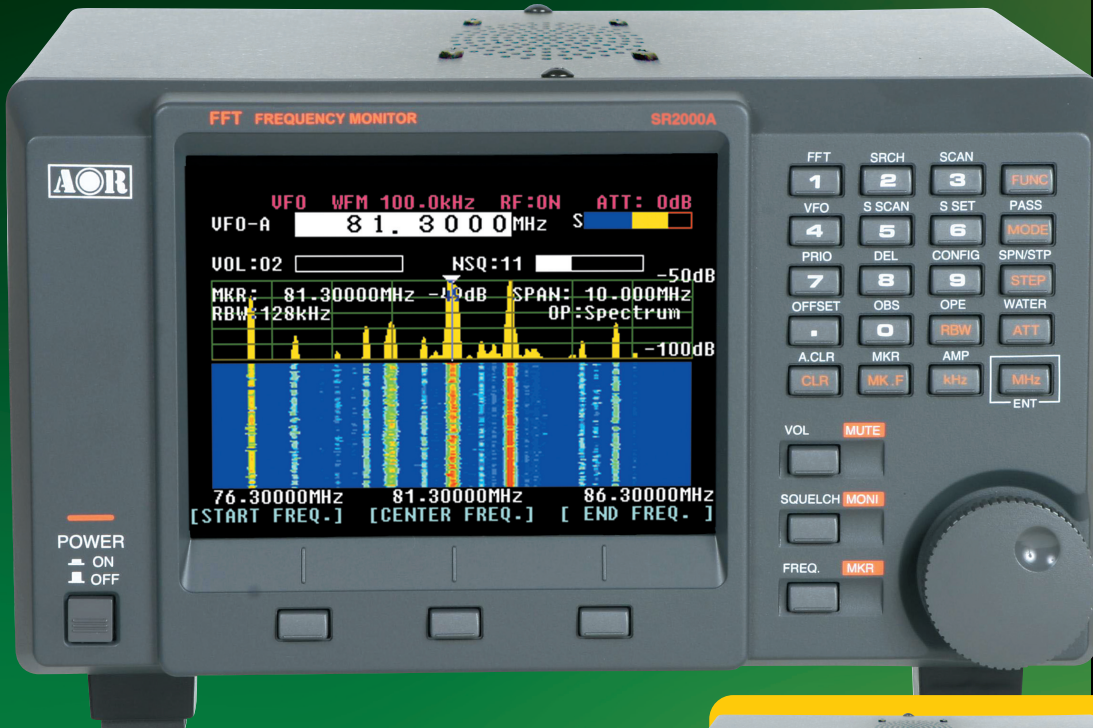
**Sangean's WFR-20 Wifi Radio**



# Watch What Happens!

*The SR2000A is an ultra-fast spectrum display monitor that lets you SEE received signals in **FULL COLOR***

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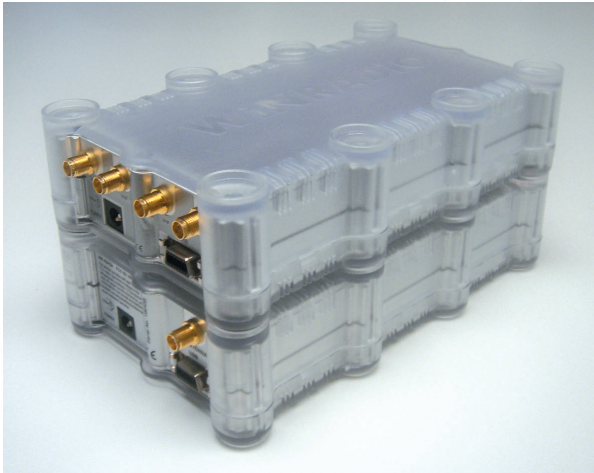
\*Government version. Cellular blocked for US consumer version.

\*\*No audio is available when the frequency span is set to 20MHz or 40MHz.

\*\*\*No audio available while displaying video signal on the LCD. If both video and audio need to be monitored simultaneously, an optional (external) TV2000 is required.



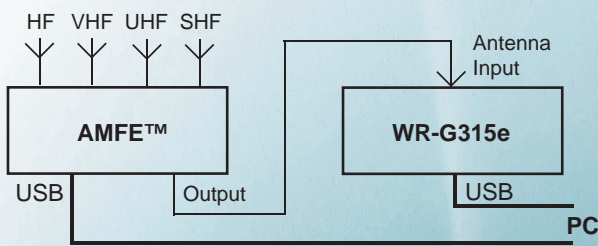
## Now that's one very powerful brick!



**WiNRADiO WR-G315e receiver enhanced with WR-AMFE-3500**



**The WR-AMFE™ adds additional antenna inputs - and more.**



Our latest add-on for the popular WR-G315 series of WiNRADiO receivers redefines the idea of "DC to daylight", yet again.

The frequency range of the WR-G315 can now be expanded up to 8.6 GHz using the AMFE™ option (Antenna Multiplexer and Frequency Extender). This is the first time a receiver of such affordable price range can go that high in frequency.

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- Low noise figure
- Simple installation
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- Suitable for any third-party receivers (AMFE-8600 only)
- Low-noise linear power supply included
- Application software included
- Programmers' API included to support third-party development

The AMFE™ unit interfaces neatly with the WiNRADiO WR-G315e or WR-G315i receiver. The receiver's application software is able to recognize the AMFE™ unit and expand the ranges of the frequency input and display automatically. Switching between the antennas and tuning the local oscillator for the downconversion is accomplished fully transparently to the user. The AMFE™ enclosure is similar to that of the WR-G315e receiver and stacks neatly on top or under it.

There are two models: WR-AMFE-3500 and WR-AMFE-8600 which extend the WR-G315 receiver's frequency range to 3.5 or 8.6 GHz, respectively. The AMFE™ units are USB controlled, supplied with application software and a linear AC/DC power adapter. The WR-AMFE-8600 model can be also used with third-party receivers, and can be optionally fitted with an OCXO for enhanced stability of 0.01 ppm, to suit the most demanding monitoring and surveillance applications.





## Lead Story

### Monitoring the Heart of Dixie

By Gayle Van Horn, W4GVH

If you travel below the Mason-Dixon line, you'll soon learn that no breakfast comes without grits and biscuits. So, it should come as no surprise that the minor league baseball team in Montgomery, Alabama (*Heart of Dixie*) bears the proud title, the *Montgomery Biscuits*.

Our intrepid scanner team is off on another working vacation. This time they ended up in Alabama's capitol city, checking out the Metro EDACS communications system shared by Montgomery's police, fire and rescue, and sheriff's departments.

Y'all come down and see us now, hear? And bring your scanner!

Story starts on page 10. Cover photo courtesy Larry Van Horn.

## C O N T E N T S

### Scanning Lake Lanier..... 14

By John Mayson

What do scanning and poetry have in common? Maybe not much, but drifting in your boat on a warm summer day while listening to communications from four counties might come close enough to heaven to awake the muse!

Why not give it a try on Georgia's beautiful Lake Lanier, named in honor of native poet Sidney Lanier? We'll get you started on the scanning; you're on your own when it comes to writing poetry!

### Reliving World War II via Radio..... 16

By Eric Beheim

Between 1939 and 1945, most Americans relied on radio to stay informed about the latest developments of World War II. Even today, hearing the war unfold in near-real time is a quite different experience from reading about it! One can sense some of the tension and apprehension that came from not knowing for certain what the final cost of victory would be.

Many recordings are available for purchase at a very reasonable price. The author lists several recommended collections. To add an additional level of authenticity, he likes to rebroadcast the audio for playback on a WW II era radio like his Zenith Trans-Oceanic.



## Reviews

Sangean's WFR-20 Wifi Radio is another entry in the new class of "radio" that gets its signals via the internet instead of the airwaves. True to Sangean's well-earned reputation, the "little radio with the big sound" provides all the features savvy internet listener could want. (See page 66.)

*MT* wraps up two other reviews begun in the June issue. We last left you with Diamond Cut 7, having removed static pops and hisses from a recording made from an old vinyl record using the DC7 software.

This month we raise the stakes by tackling a live transmission in which the desired signal is barely audible above the noise floor. (See page 67 for the results.)

Last month we were also playing with WorldStation, a sophisticated radio control program. This month we test one of its most intriguing features: the ability to control up to 10 radios in a variety of configurations. Radios can even be controlled and linked via the internet for remote monitoring (see page 72).





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Address: 7540 Highway 64 West,  
Brasstown, NC 28902-0098  
Telephone: (828) 837-9200  
Fax: (828) 837-2216 (24 hours)  
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[www.monitoringtimes.com](http://www.monitoringtimes.com)  
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#### Owners

Bob and Judy Grove  
[judy@grove-ent.com](mailto:judy@grove-ent.com)

#### Publisher

Bob Grove, W8JHD  
[bobgrove@monitoringtimes.com](mailto:bobgrove@monitoringtimes.com)

#### Managing Editor

Rachel Baughn, KE4OPD  
[editor@monitoringtimes.com](mailto:editor@monitoringtimes.com)

#### Assistant Editor

Larry Van Horn, N5FPW  
[larryvanhorn@monitoringtimes.com](mailto:larryvanhorn@monitoringtimes.com)

#### Art Director

Bill Grove

#### Advertising Svcs.

Beth Leinbach  
(828) 389-4007  
[bethleinbach@monitoringtimes.com](mailto:bethleinbach@monitoringtimes.com)

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## EDITORIAL STAFF

Email [firstlast@monitoringtimes.com](mailto:firstlast@monitoringtimes.com)

TJ "Skip" Arey..... On the Ham Bands  
Rachel Baughn..... Letters to the Editor  
Kevin Carey..... Below 500 kHz  
John Catalano..... Computers & Radio  
Mike Chace..... Digital Digest  
Marc Ellis..... Radio Restorations  
Bob Grove..... Ask Bob  
Glenn Hauser..... Global Forum  
Chris Parris..... Fed Files  
Ken Reitz..... Beginners Corner  
..... Communications  
Iden Rogers..... Planes  
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Hugh Stegman..... Utility World  
Ernest Robl..... Trains  
Gayle Van Horn..... Frequency Manager  
..... Broadcast Logs  
..... QSL Corner  
Larry Van Horn..... Milcom  
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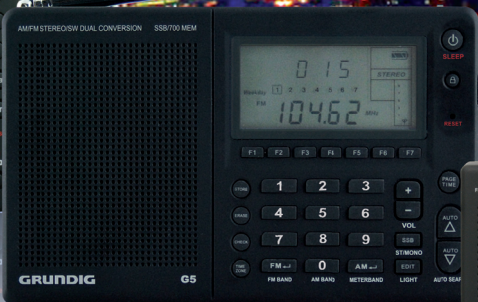
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AM/FM/Shortwave Portable  
Radio with MP3 And SD player | \$200.00

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- Station name input features allow a 4-character input of the stations call letters



## G6 AVIATOR

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- AM, FM, Aircraft Band (117-137 MHz) and Shortwave (1711-30000 KHz)
- Dual conversion
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Receives  
AM Band



Receives  
FM Band



Receives  
Shortwave Band



Alarm  
Clock



Headphone  
Jack





## Satellit 750

AM/FM/Shortwave Radio with SSB | \$300.00

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- Auto/Manual/Direct frequency key-in and station memory tuning
- 1000 station memories (each band 100 memories, 500 customizable)



## GS350DL FIELD RADIO

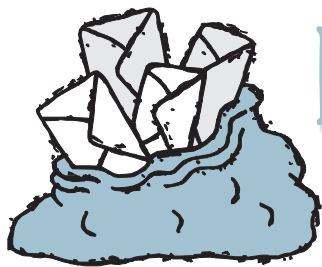
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# LETTERS TO THE EDITOR

This column is open to your considered comments. Opinions expressed here are not necessarily those of *Monitoring Times*. Your letters may be edited or shortened for clarity and length. Please mail to Letters to the Editor, 7540 Hwy 64 West, Brasstown, NC 28902 or email [editor@monitoringtimes.com](mailto:editor@monitoringtimes.com)  
Happy monitoring!  
Rachel Baughn, Editor

## MT at NASB

MT's first-time attendance at the National Association of Shortwave Broadcasters meeting at Trans World Radio's headquarters in Cary, North Carolina, was highly rewarding. The first day was a meeting of the USA Digital Radio Mondiale (DRM) group, which brought encouraging news regarding promising new DRM receivers and potential testing of DRM signals for the state of Alaska.

MT editor Rachel Baughn spoke to the group on the second day. In addition to giving a short history of the evolution of *Monitoring Times* – representative of the evolution of the radio hobby itself – Rachel stressed that MT exists in large part to introduce radio broadcasters to their audience and to inspire listeners to turn their radios on. She challenged the stations to provide advertising or information that will make MT readers choose to tune in their station over the 128 others listed in the Shortwave Guide section. And, of course, to ensure the information listed in the magazine is accurate.

She closed with a letter from MT reader Kraig Krist of Manassas, Virginia, who wrote, "Please stress the vitality of shortwave. Shortwave is flexible, reaches millions and works in a time of emergency."

"The same can not be written about radio via the internet. While some mistakenly believe a huge savings is discovered by internet radio broadcasting, the 'broadcasts' don't reach many at all. The internet is not flexible. The internet is not reliable. The internet is too easily blocked. The internet is not useful in a time of emergency. In addition, the internet is not convenient."

"The internet does complement. The [monitoringtimes.com](http://monitoringtimes.com) website complements the printed 'Monitoring Times.'

"Many international broadcasters have websites complementing their shortwave transmissions."

"For those who still feel the internet is the Holy Grail, they should ask themselves, 'Has the internet done away with printed publications and books?' The answer is 'No.' This also applies to shortwave."



## Some Broadcasters "Get It"

In one recent survey, more than 50% of responding shortwave listeners said they considered themselves "content listeners" as opposed to utility listeners or DXers. In this,

# PERSEUS

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U.S. listeners aren't that different from listeners across the globe. Allen Graham of HCJB told the audience at NASB that people will turn to shortwave stations if there is something they are not getting from their local stations. It is lack of local choices that drives most SW listening, and people will go to whatever medium is available to find the information they are looking for.

Mike Adams, NASB vice-president and an engineer for FEBC, reinforced the point that audiences will migrate to whatever medium has the best talent, entertainment, and information. If the talent switches to FM stations, so will the audience. He made the case that, contrary to popular belief, it is possible for shortwave broadcasters to provide local content and to attract audiences, especially in rural areas, with good programs and a longer block of air time.

Shortwave stations can even be of assistance as an early information source under emergency conditions, prior to local stations being restored. NASB is encouraging its members to plan ahead regarding what time slots might be sacrificed for public service announcements or other information in a crisis. FEBC has just created a "station in a suitcase" and is training local officials in a few disaster-prone areas on how to use it to broadcast to both the outside world and the local population. Emergency response agencies and the United Nations are being asked to consider stockpiling emergency radios for use by people who have lost everything but the clothes on their backs.

If you'd like to listen in to the NASB and DRM presentations, including the talk by editor Rachel Baughn, all talks and Power Point presentations will be available on the NASB website at [www.shortwave.org](http://www.shortwave.org).

## May Issue Kudos

We've had a lot of compliments and requests for reprints from our May amateur radio edition. Top marks go to the lead article

on digital modes by Larry Van Horn and to the article on D-STAR by T.J. Arey. Here's a typical example:

**"Working the World with Ham Digital Modes.** Great article.

**"VOIP and Ham Radio** (You'll get some flak on this [actually, we haven't] but I have used Echolink into distant repeaters with an HT and Laptop since 2003... it's a wonderful way to stay in touch with Worldwide ham friends on THEIR repeaters!)

**"Programming Spotlight** (Wonderful Educational Links to check out!)

**"A D-Star is Born** (VERY useful system for relatively rapid data transmission in emergencies. The system can even be accessed from a laptop with a 'Dongle' interface. Hopefully D-Star node owners will not block laptop access like some EchoLink Node owners do!)

**"West Mountain Radio RIGBlaster Pro.** Good info!

**"Getting Started.** Useful and timely 10m info. 10m hangs in here more at our latitudes especially in contests."

*Mahalo, Paul Peretta KH6/G3SEA*

## Antec Notebook Cooler

"I just ordered the Antec Notebook Cooler. In the *Computers&Radio* article in the April issue of *Monitoring Times* (yes, I'm catching up on my reading!), you listed the price as \$20. Actually, the price is \$39.95. However, if you order the B Stock Antec Notebook Cooler ([www.antec.com/Detail.bok?no=481](http://www.antec.com/Detail.bok?no=481)), the price is \$19.95. Antec states, 'B stock is fully functional but may have minor blemishes, though often looks new.' In addition, the warranty for B Stock is 90 days; for the \$39.95 version, the warranty is for three years.

"I ordered the B Stock Cooler, based on your recommendation in the April article and the fact that I'm a bit cheap. I also downloaded and am using PC Wizard from <http://cpuid.com>. It looks like a very useful utility. Thanks

for mentioning these two products in your column. Anything I can do to increase the lifespan of my laptop is welcome.

"By the way, my Dell laptop came with Vista installed. After a month of aggravation, I downshifted to XP Pro. I'm much happier now."

*Peter Farris*

## How I Found MT Express...

"I found out about *MT Express* from the subscription information in the back of a *Monitoring Times* magazine that I purchased from a bookstore.

"I'm a long time Electronic Engineering Design Technician, so I have tons of free technical magazines to read every month to stay current in my field. I know how inconvenient it is to have to carry a magazine around and try to read it and remember everything in it before it is retired to 'the stack in the garage,' :- ) ... and, then to try to remember how far down in the stack it is if I want to review an article weeks, or months, later. The electronic format for *MT Express* is really convenient because it doesn't take up any storage space, and is always easy to find and review later.

"This is the only 'magazine' I get that holds my interest through every paragraph on every page, partly because I can have access to it, conveniently, all month long because it is in an electronic format. *MT Express* covers a lot of my Amateur Radio interests, along with my SWL and utility monitoring interests, along with project ideas.

"I had heard of *Monitoring Times* for many years, but I had never really considered the vast amount of useful information it would contain until I subscribed! I guess the bottom line is that I sorta stumbled onto *MT Express* by accident, but I'm sure glad I did!"

*73, Kenneth Keese K5KKG*

## Art Bell Fan

"I'm writing to let you know that I was pleasantly surprised by April's *MT* feature story about Art Bell. I thoroughly enjoyed it. So much so that I decided to renew my subscription for three years instead of just one. I've been reading *MT* (off and on) since I was in middle school (20 years or more ago). Now it's even better. Keep up the great work over there!"

*Eric Hopkins*

## Used SW Receiver?

*MT* received a request from a disabled shortwave hobbyist in Laredo, Texas, who is looking for help with an *MT* subscription and a used radio. She says her Grundig Mini-300 is damaged and she does not watch TV. Radio is her companion for news and contact with the world.

*MT* can help with the subscription, but we thought we'd ask our readers if anyone has an extra radio they might donate or sell at a reduced rate? If so, please contact editor Rachel Baughn at [editor@monitoringtimes.com](mailto:editor@monitoringtimes.com). Passing along an unused radio is always a great way to keep the hobby – and its spirit – alive.





# COMMUNICATIONS

by Ken Reitz

## SHORTWAVE/AMATEUR RADIO

### Alaska Tech Firm to Test DRM

Digital Aurora Radio Technologies of Delta Junction, Alaska will test Digital Radio Mondiale (DRM) transmissions on 5, 7 and 9 MHz in statewide broadcasts, according to the web site [26MHz.us](http://26MHz.us). The report notes that, because of its size, Alaska is underserved by a statewide radio service and believes DRM on shortwave could be the solution. The report says that the Federal Communications Commission (FCC) has assigned WE2XRH as the call sign for this experimental station. Other reports indicate that the tests will use standard 10 kHz channel widths and possibly employ wider bandwidth in later tests with power levels as much as 100 kW. The tests could last for two years. There was no word at press time as to when tests will begin or exactly what frequency they will use.

### RFE/RL Complain of Cyber Attacks

"If you can't jam the station – jam the web site," appears to be the philosophy behind recent cyber attacks on the Radio Free Europe, Radio Liberty and their associated web sites, according to a report in *Radio World On-line* at the end of April. The "denial of service" attacks are similar to ones suffered by other government web sites in the past and act to grind the site to a halt with bogus requests. The report says the action appears aimed at the RFE/RL Belarus service.

### BPL Declared DOA in Dallas

A report in the May 2, 2008 *Dallas Morning News* declared a planned Broadband over Power Line (BPL) system dead when a local power system in Dallas was sold. The new owners, Dallas-based utility Oncor, said they would shut down the BPL end of the business. The newspaper report quoted Oncor as saying they were not in the telecommunications business and had no plans to begin.

In other BPL news, a report on CNET <http://News.com> said that a federal appeals court judge criticized the FCC for picking and choosing data to support its push to encourage development of BPL services. The Commission was said to have rejected American Radio Relay League (ARRL) data that showed the potential harm to the amateur radio service that BPL could cause.

### CA Nixes Cell Phone Drivers

There was a little confusion about new laws going into effect July 1 in California that will

restrict the use of "wireless telephones" while driving. But, according to a spokesperson for the California Highway Patrol, the laws do not affect the operation of ham or CB two-way radio use.

As written, the two laws cover two groups of people. The first law "prohibits all drivers from using a handheld wireless telephone while operating a motor vehicle. Motorists 18 and over may use a hands-free device. The second law prohibits drivers under the age of 18 from using a wireless telephone or a hands-free device while operating a motor vehicle."

The announcement goes on to say that "the law does provide an exception for those operating a commercial motor truck or truck tractor (excluding pickups), implements of husbandry, farm vehicle or tow truck, to use a two-way radio operated by a 'push-to-talk' feature." And that's where the confusion began. Many read the law to include hams or CB operators, but the CHP categorically said that it does not.

If you're caught, the fine for a first offense is \$20 with \$50 for subsequent convictions. But, with additional penalty assessments, the first offense would really be \$76 and a second offense \$190. The good news is that points will not be added to your driving record! The law also applies to out-of-state drivers whose states do allow such wireless mobile operation.

## PUBLIC SERVICE

### What Channel Was That On?

Reporters at Atlanta's WSB-TV, using an off-the-shelf "rearview camera" system sold in a local auto supply store to aid motorists in being able to see what's behind them as they back up, found them quite entertaining. They discovered that by driving through various parts of Atlanta they were able to look into sleeping children's bedrooms as well as local strip clubs. Apparently the \$100 wireless receiver can pick up any other wireless TV transmitter using the same frequency. The devices are popular security cameras for homes and businesses alike, and the users have no idea their signals aren't private. The station contacted the manufacturer who said that, properly installed, the devices shouldn't be able to pick up other signals.

### "Hurricane-Proof" Schools also RF-Proof

A report on Orlando's Channel 6 web site reports that when counties built local schools to withstand hurricane force winds, they also built them so that radio signals had difficulty getting through. The problem stemmed from having to use thick concrete and steel construction

techniques on facilities that are used in times of hurricanes as public shelters. Unfortunately, the report said, there were radio dead spots in parts of all 85 public school buildings in Florida's Brevard County. School officials are having to resolve the problem while working within already tight budgets.

## BROADCAST AM/FM/HD RADIO

### NPR's "War on LPFM" Explored

An article on the web site Ars Technica (<http://arstechnica.com>) details the long running battle that National Public Radio has waged against Low Power FM (LPFM) stations nationwide. On the surface it would seem that NPR would be allied with LPFM stations in seeking a world of diversity on the nation's FM band, but it's more complicated than that, as the article explains.

### FCC Guidelines for Public Regarding Broadcasting

A new publication from the FCC, "Public and Broadcasting: How to Get the Most Service from Your Local Station" has just been updated and made available from the FCC and is found here:

[www.fcc.gov/mb/audio/decdoc/public\\_and\\_broadcasting.html](http://www.fcc.gov/mb/audio/decdoc/public_and_broadcasting.html).

It's an extensive overview of how the FCC regulates the public's airwaves; explains the licensing procedures and the obligations that licensees have to the public. It details how to obtain public information about the stations in your area and what citizens can do if they feel the station is not being operated in the "public interest, convenience and necessity." It's a must-read for anyone who feels their local stations could be doing better.

## SATELLITE TV/RADIO

### Satellite Radio Merger Draws more Fire

The tedious saga of the XM/Sirius merger, which received Department of Justice blessings but can't seem to get FCC approval, has seen a parade of groups and organizations voicing approval/disapproval and still no word from the Commission. The latest group to issue an opinion, as reported in satellite trade publication *SkyReport*, is a group of terrestrial broadcasters who chided the FCC for "wanting it both ways." The group, whose interests are in keeping the satellite radio entities in exhaustive financial

competition, includes many broadcast heavyweights Beasley Broadcast Group, Entercom Communications, Greater Media, Lincoln Financial Media and Saga Communications.

In a joint letter released in early May, the group noted "...recent judgments of the FCC and the DOJ are fundamentally inconsistent. If audio market competition faced by satellite radio providers is as wide-ranging as the DOJ found, then this broader competition for listeners necessarily impacts traditional AM/FM and HD Radio as well, and should have been considered in weighing the continued relevance of the broadcast multiple ownership rules." The group is said to want the FCC to require a merged satellite radio company to build receivers that included HD-Radio reception capability. Meanwhile, both companies have agreed to extend their merger agreement now over a year old.

Despite the fact that neither satellite radio service has turned a profit, their top corporate officers have raked in the cash, options, stock awards and other large bits of compensation. According to industry reports quoting from required stock filings, Sirius CEO Mel Karmazin was given over \$32 million in compensation in 2007 while the former XM CEO got over \$12; the current XM Chairman got nearly \$6 million and current XM CEO received over \$4 million in various forms of compensation for 2007.

## Bored in the Skies

For years air travelers have been dreaming of ways they can play video games, surf the Web, do their e-mail and shop on-line auctions. At least that's what engineers on Southwest and Alaska Airlines have thought. That's why they are preparing in-flight WI-FI services for passengers who don't want to read in-flight magazines, a book or just listen to music. A report in TV Technology (<http://tvtechnology.com>) says both airlines are looking at various schemes to provide high-speed, in-cabin, Internet access. One plan is to use 800 MHz sky-to-terrestrial network hook ups and another is to use existing Ku-band satellite bandwidth on geostationary satellites. Expect a few years before either are in place. No telling what such service would add to already strained ticket prices.

## FCC ENFORCEMENT

### Antique Radio Collector Fine Upheld

The FCC has been pursuing a case which began in November 2006, involving Richard Mann who runs an on-line business known as "The Antique Radio Collector." In March 2007 the Commission fined Mann \$7,000 "for marketing uncertified fully assembled AMT3000 AM transmitter kits from a third party, assembled the transmitters at his residence, and advertised the assembled transmitters for sale..." on his web site. The FCC further discovered he had been doing this since December, 2003. The Commission fined Mann \$7,000 but noted in a Memorandum Opinion and Order released April 30, 2008, that he had asked for the fine

to be reduced or cancelled despite continuing to advertise the products for sale. The request was denied.

### Inept Owner Gets Fine Reduced

In a forfeiture order released April 28, 2008, the FCC slapped the owner of WBNB-AM, Meridian, Mississippi, with an \$8,000 fine for "operation of the station from an unauthorized location and operation at a power level in excess of that authorized by the license." The station, operating at 2.5 kW during the daytime was to reduce power to 300 watts at local sunset. According to FCC documents, the station owner, Frank Rackley, Jr., admitted that the station operated at full power until it was manually signed off the air at 9:00 pm CT and that the coordinates listed on the license had been for an intended transmitter location in a deal that fell through. Rackley claimed the struggling station couldn't afford the fine; the Commission took a look at the station's finances and agreed to reduce the fine to \$1,500.

### Phone Solicitors Liable for \$20,000 Fine

Think it doesn't matter to be on the FCC's "Do Not Call" list? AZ Prime One Mortgage Company found out it does. After making calls soliciting their service to two numbers on the Do Not Call list, the Commission found the company liable for a \$20,000 fine.

On the other hand, the Commission reminds consumers that not every unwanted call is a prohibited call under their rules. "Calls made by or on behalf of a tax-exempt nonprofit organization...calls that are made to a person who either has provided prior express invitation or permission to call or has an established business relationship with the caller...[and] telephone solicitations...in which the caller has a personal relationship with the called party" are allowed.

### FCC's Chair under Scrutiny

The *Washington Post* reported in early May that FCC Chairman Kevin Martin may be asked to give testimony to a subcommittee on oversight and investigations. The committee is looking into charges that information relevant to matters brought before the FCC monthly meetings is withheld until just before votes were to be taken at those meetings. The report said that 30 current and former FCC employees had been interviewed as part of the investigation.

"Communications" is compiled by Ken Reitz KS4ZR ([kenreitz@monitoringtimes.com](mailto:kenreitz@monitoringtimes.com)) from news clippings and links supplied by our readers: Many thanks to this month's fine reporters: Anonymous, Rachel Baughn, Mark Cobbledick, Bob Fraser, Bob Grove, John Mayson, Larry Van Horn.

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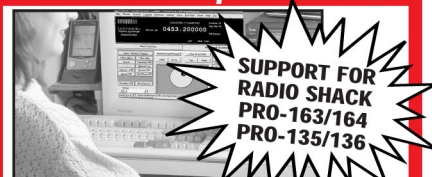
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# Monitoring the Heart of Dixie

By Gayle Van Horn, W4GVH



**T**here we were, sitting amidst the roar of a home field partisan crowd. Suddenly we heard the crack of the bat and then a chant of “Hey Butter – Butter – Butter!”

“Butter – Butter – Butter?” Shouldn’t that be Batter – Batter – Batter?

So what new adventure has the *MT Btown* scanner team gotten themselves into this time?

Larry and I were at a minor league baseball game – a *Montgomery Biscuits* baseball game. We were planted firmly in the stands with a wild and rowdy sellout crowd of baseball fans still pumped up from the team’s previous victory.

Well, what could be better on a warm spring evening than a stirring game of minor league baseball and a handheld scanner? As the chant from the fans swelled, audio from the local police radios filled the speaker of my GRE PSR-500 scanner in the spectrum sweep mode.

I looked up to see what I thought was a baseball heading towards the stands. It’s so close I know I can catch it. With outstretched arms I was ready to catch the ultimate souvenir. The fans around us were in a frenzy!

But, wait a minute, something just doesn’t look right. Just what is that heading towards us in the stands? The object lands with a plop in the bleachers just out of my reach. “Good grief... that’s not a baseball, it’s a biscuit,” says Larry. Just then I see an air cannon on the field fire another volley of biscuits into the stands, and the crowd is on its feet again. Nearby, Montgomery’s finest scan the crowd in case there’s a fight for one of these flaky favorites.

The Biscuits are firing biscuits, not baseballs, for the fans to enjoy during the game.

The *Montgomery Biscuits* is minor league baseball in Montgomery, Alabama – a city known as the *Heart of Dixie*, but there’s nothing minor about this capital city in America’s deep south or the radio system that supports its public safety agencies.

## Early Days in Montgomery

Prior to statehood, Alabama was the name of a city built by General John Scott and a group of Georgians. The city was nearly abandoned when a second group of poor New Englanders founded a nearby town they called Philadelphia. Scott and his group then built a new town they called East Alabama.

The rivalry between the two groups was finally settled in 1819 when they merged the

towns under the name of Montgomery, Incorporated, a name chosen to honor General Richard Montgomery who died in the Revolutionary War. Eleven days after Montgomery’s founding, Alabama was admitted as a state on December 14, 1819.

The year 1820 was an important one for Montgomery. The city’s first Police Department was established as the primary law enforcement body for a growing city as new settlers moved to the area. Within a year it would become a major center for industry and cotton production. On January 30, 1846, the Alabama Legislature announced it had voted to remove the capital city from Tuscaloosa to Montgomery. Once the *Capital of the Confederacy* and the center of the Civil Rights Movement, Montgomery has earned her place in history and has her sights clearly focused on the future.

## A Mission that Continues

Not unlike the early days of 1820, the *Montgomery Police Department* holds firm in their mission to enforce the law in a fair and impartial manner. Situated 90 miles south of Birmingham and 160 miles west of Atlanta, the Montgomery Police Department serves over 300,000 people daily, both residents and commuters. The department employs a force of 510 sworn officers and 200 civilian employees, headed by Police Chief Col. A.D. Baylor. The Chief’s number one goal to the people of Montgomery is to “provide the city and other state and local agencies with professional highly trained and effective police officers.”

The *Patrol Division* is headed by Commander Major T Jett. The division consists of three shifts that rotate 24 hours a day and four other bureaus and units. Those include the Uniformed Patrol, the K-9 Bureau, Domestic Violence, Animal Control, COP - Community Oriented Policing, the Bike Police, and Special Events units.

## A Joint Program that Works

The *Community Oriented Policing Bureau* was started in May 2000 to strengthen relations between the Police Department and the public. Specialized sections within this bureau include:

- *C.O.P. Services* (including the M.P.D. Bike Unit) uses community policing to promote good relations between neighbors and the Police Department. Officers assigned to this unit can be



seen at designated areas of the city and at large public events.

- *Crime Prevention* addresses issues related to promoting the Department’s Crime Prevention program as well as the Business and Neighborhood Watch programs. Officers meet with individual businesses and neighborhood groups to give guidance and setting up Watch Programs.

- *Citizens Academy* is an educational program to give the public a working knowledge of the Montgomery Police Department personnel and policies. Topics covered include Criminal Investigation, Patrol Operations, Communication, Crime Prevention and more.

## The Weed and Seed Program

The *Weed & Seed Program* is a comprehensive multi-agency approach to law enforcement, crime prevention, and community revitalization. It’s a program that aims to reduce violent crime, drug abuse, and prevent as well as control violent crime and gang activity in designated high-crime neighborhoods.

The program’s strategy involves a two-part approach: law enforcement agencies and prosecutors cooperate in “weeding out” violent criminals and drug abusers, and public agencies and community-based private organizations collaborate to “seed” much needed human services, including prevention, intervention, treatment, and neighborhood programs.

## Montgomery’s Detective Division

The department’s *Detective Division*, is divided into four specialized bureaus: *Property Bureau*, *Persons Bureau*, *Crime Scene Bureau*, and *Special Investigations Bureau*.

The *Crime Scene Bureau* provides support for the entire Police Department in the form of crime scene investigation, fingerprint identification, and all forms of photography. This Bureau is predominately responsible for working crimes to include murder, rape, robbery, and burglaries.

*Persons Crimes Bureau* is responsible

for the investigation of felony crimes against persons and is divided into the Homicide Unit, Robbery Unit, Special Victims Unit, and Street Crimes Unit.

*Property Bureau* is responsible for all felony property crimes, divided into: General Investigation Unit, Pawn Shop/Scrap Yard Detail, Auto Theft Task Force, and White Collar Crimes Unit.

Assisting the Montgomery Police Department and other divisions of the Alabama Department of Public Safety, are the Capitol Police Unit, posted at the Capitol complex.

## Alabama Capitol Police

Nestled atop Capitol (Goat) Hill at the east end of Dexter Avenue in downtown Montgomery, sits a massive Greek-Revival structure, the state capitol of Alabama. The 1851 building was the capitol of the Confederacy during the first three months of the Civil War and where Jefferson Davis was elected president. The Capitol is also where the Selma-to-Montgomery March ended and civil rights were born.

Protecting the Capitol complex are the Capitol Police force, under the Protective Services Division of the Alabama Department of Public Safety.

The first Alabama State Capitol Police can be traced to the turn of the 20<sup>th</sup> century, when a night watchman maintained vigil at the Capitol. The State Capitol Police force of today have evolved into a full-service, professional law enforcement organization. In 2003, the force was transferred into the Alabama Department of Public Safety through a legislative act.

Major Herman Wright is the Division Chief of the Capitol Police, staffed by approximately 24 officers, along with supervisors, support staff and a unit commander. The unit provides a 24-hour, seven days a week service with a fully staffed Communications Center, which may also be utilized as a fully functional command center during a state of emergency.

The Capitol Police Headquarters serves as the main control operations of the Capitol Police force, located in the Capitol building. They provide access to local, state and federal information systems. The headquarters provides assistance to the unit in its normal daily operations and during emergencies.

Though similar to a municipal police officer, the Capitol Police force must meet the standards of the Department of Public Safety as well as the requirements of the Alabama Peace Officers Standards and Training Commission. State Capitol Police have the same powers as peace officers in Alabama and the authority to exercise those powers statewide. Their primary focus remains the Capitol complex area, one that contains a large number of state employees and sig-



nificant buildings situated in a concentrated area. Other duties include patrol and officer presence, enforcing traffic laws, assisting motorists and providing assistance to visitors and dignitaries.

## Montgomery County Sheriff

Sheriff D.T. Marshall is the Chief Law Enforcement Officer in Montgomery County. His staff, under five divisions, comprises 118 Deputies, 83 Correctional Officers, and 56 clerical employees.

*The Administrative Division* consists of Supply, Communications, Crime Scene Unit, Community Relations Recruiting, School Relations and the Traffic Enforcement Unit. Each unit is staffed by specialized personnel that are trained in their respective areas.

The Administrative Unit is often called by the sheriff and his staff to perform duties that do not fall into the areas of any other division. The Administrative Division responds to serious incidents to provide backup and support for other divisions in the department.

*Criminal Investigation Division* comprises the Criminal Investigation, Special Operations (Tactical Operations), Firing Range, and Task Force Assignments. Within this division there are 23 employees, 20 sworn officers and three civilian employees. This division is responsible for all the investigations that are conducted by the Sheriff's Office with the exception of internal investigations.

*The Legal Service Division* consists of 34 sworn officers and 18 civilian employees. The staff is responsible for Civil Process, Warrants, Extraditions, Identification, Records, Probate Transport, Bookkeeping and Court Security.

*The Criminal Patrol Division.* Labeled as the backbone of the department, the Criminal Patrol Division is the only division that operates twenty four hours, seven days a week. The division is assigned to three shifts, utilizing the assistance from seven specialized trained canines for explosive and narcotic detection and officer protection, apprehension, and tracking. Patrol Deputies are the first responders who work throughout the county, assisting the citizens and enforcing the law.

*Montgomery County Detention Facility* provides for the safe, secure and constitutional confinement of those persons committed to the custody of the jail, either awaiting trial or upon sentence of the court. The Facility holds prisoners for the Sheriff's Office and all law enforcement agencies in Montgomery County. Correctional Officers provide indirect supervision from inside a control booth while Roving Correctional Officers patrol the halls and control stations to ensure civil rights of inmates are protected, to reduce tension and to keep negative behavior to a minimum. The Montgomery County Jail Expansion program, a \$47.3 million project is expected to be completed by October 2008.

## Montgomery Fire/Rescue

As early Montgomery was setting its police force in motion, there existed an equally vital need to organize a volunteer fire department.

Prior to statehood, the people of Mont-

gomery depended on each other to protect their property from fire through a system of cisterns, wells and springs. By 1830, there was a wagon equipped with thirty leather buckets and twenty-five-foot ladders manned by volunteers. The Dexter Company became the first fire company and received a charter from the Legislature on February 28, 1848. At the same time, the city of Montgomery purchased its first fire engine, a Hunneman hand engine, which firemen dragged with ropes to the scene of the fire.

During the closing days of the Civil War, a federal cavalry unit, Wilson's Raiders, approached the city. The Mayor, Council and Confederate Commanders decided to surrender the town and to burn the thousands of bales of cotton stored in the warehouses. As the cotton fibers created a cloud of black smoke over Montgomery, the brisk wind off the river blew hot embers onto surrounding buildings. An African-American firefighting company, later named the Grey Eagles, received credit for saving the city of Montgomery from disaster.

During 1870-1890, equipment became more sophisticated. Horse-drawn steam engines were added to the Alabama Company. A steam engine was also added to the Dexter Company, pulled through the streets by a giant mule called "Lion." The Lomax Company, named for a Montgomerian who died at the Battle of Seven Pines, had about 90 members. In 1887 the Lomax Company built a handsome new station on Scott Street, the first "suburban" fire house in Montgomery.

In the early 1900s, the City purchased two chemical wagons, which had hose beds and 40-gallon tanks. A few years later, a triple combination pumper – the first motorized pumper capable of 900 gallons of water a minute – advanced their fire fighting. In 1938 another station was added, and in the 1940s a new ladder truck with a 65-ft aerial ladder was purchased.

## Dedicated Divisions

In the 1970s, the *Bureau of Investigation* was established, and began providing citizens and business owners with a full investigation of their fires. Montgomery Fire/Rescue Bureau of Investigations is a Law Enforcement Team with the responsibility to investigate fires involving criminal activity, multiple fire alarms or loss of life. The team's mission is to accurately determine the cause of all working fires within the City of Montgomery.

*The Special Operations Division* began with one Hazardous Material team developed in 1978, located on Air Base Blvd., Fire Station Number Four. The department includes specialized rescue and hazardous material containment functions. City funding and the Department of Homeland Security have extended the capabilities of the Montgomery Fire/Rescue to two Hazardous-Material teams, one Heavy rescue team and a large arsenal of specialized equipment and tools.

The Haz-Mat teams consist of 60 members. All are State of Alabama Certified Hazardous Materials Technicians trained to mitigate emergency situations from accidents involving rail card, tank trucks, or clandestine labs.

The *Heavy Rescue Team* was formed in



2003 from Fire Station No. 3. The team consists of 20 members that respond to technical and non-technical rescue situations such as High Angle Rope Rescue, Confined Space Rescue, Trench Rescue, Surface Water Rescue, Structure Collapse and Vehicle Extraction. The *Special Ops teams* respond to incidents within the city of Montgomery and have also been assigned the duties of the Regional Response Teams for the Southeast.

In 2002 the department converted their rescue fleet to modular units and added a sixth unit to keep pace with the increasing volume of calls and maintain response time.

The Fire/Rescue Department of 2008 has 16 Class-A Pumpers, six Ladder Trucks with at least a 100-ft Aerial Ladder, six Paramedic Trucks, two Haz-Mat Teams, Heavy Rescue Truck and a Dive Rescue Team

## Training

The Training Division is comprised of a nine member staff of Training Officers, responsible for carrying out the objectives of the Fire Department. The Division is responsible for training the new Firefighter Recruits as well as continuing education for existing Fire Department personnel.

Academy courses, taught by the Training Division, include a 22 week Recruit School, eight week Officer Candidate School, Emergency Medical Services, various Fire College Certification Courses, and monthly Company Drills.

In addition to the academic training, cadets receive training in Public Education and the Recruitment of new personnel by the Division of Training. The mission of the Division of Training is to provide the City of Montgomery with fire fighters who are highly trained and effective to meet the public service and public safety needs.

## Fire Medic

The Division of the Fire Medics is the most active of the Montgomery Fire/Rescue. In 1975, the paramedic program became a part of the Montgomery Fire Department. Two fire medic units were placed in service, and completed their first full year of operation in 1976. Today, the Montgomery medic division serves the city with six rescue trucks and one shift commander answering almost 20,000 calls a year.

The Montgomery Fire/Rescue have retained their mission from the beginning days of leather buckets and hand pumpers. Their resolve continues to protect the lives and property within the City of Montgomery. Whether responding to hazardous material incidents, medical emergency, disasters or fire emergencies, Fire/Rescue provides Montgomery with highly trained professional emergency services.

## Dedicated professionals

All of the public safety agencies mentioned above use an 800 MHz EDACS trunk radio system. Based on monitoring information while we were in the area, we were able to determine that this appears to be a three site system. Listeners

will hear a mix of analog and ProVoice digital modes. Table one list the addresses of major users of this system.

Table two is a list of the frequencies and talkgroups we observed during our visit. Table three is a list of the radio codes used by the Montgomery Police Department (an official list from the agency website).

An historian once said that Montgomery, "through its times of strife and uncertainty, became the pride of Alabama." In its early days when cotton was king, police and fire volunteers built their companies with pride and determination. Both departments have not wavered in their missions to protect and serve the people of this proud and historic city.

The heart of Dixie beats strong in Alabama, and a *Montgomery Biscuit* baseball game is not a bad idea, either.

*The author would like to thank the Montgomery Police Department, Fire/Rescue, Alabama Department of Archives and History in Montgomery, the Alabama Department of Public Safety, and several scanner enthusiasts in the Montgomery area, who wish to remain anonymous, for their assistance in preparing this article.*

**Table One: Area Public Safety Agencies and Addresses**

### Montgomery, Alabama Police Department

Addressees at Departmental Divisions, Montgomery Police Department, Montgomery, AL36104:

- Business Watch
- Administrative Division
- Administrative Division, Chief's Office
- Detective Division
- Juvenile Division
- Juvenile Division, Commander
- Patrol Division
- Patrol Division, Commander
- Secret Witness
- Special Operations Division
- Traffic Division
- Traffic Division, Commander
- Training & Recruiting
- Information-Administration

Other Police Dept addresses:

Administrative Division, Community Policing, 3046 Fairwest Place, Montgomery, AL 36108

Departmental Divisions, Montgomery Police Department, Emergency Police Service, 320 North Ripley Street, Montgomery, AL 36104

Montgomery County Department of Human Resources, 3030 Mobile Highway, Montgomery, AL 36108

### Montgomery, Alabama Fire/Rescue Departments

Alabama Association of Volunteer Fire Department, 660 Adams Avenue, Montgomery, AL 36104

Catoma Volunteer Fire Department, 50 Booth Road, Montgomery, AL 36108

Departmental Divisions, Fire Department...

- Arson Bureau, Montgomery, AL 36104
- Codes & Standards, Montgomery, AL

36104

- Deputy Fire Chief, Montgomery, AL 36104
- Emergency Fire or Medical, Madison Avenue, Montgomery, AL 36104
- Fire Chief, Montgomery, AL 36103
- Fire Protection, Montgomery, AL 36104
- Internal Affairs, Montgomery, AL
- Fire Department - Snowdon VFD - Administrative Calls, Montgomery, AL 36104
- Fire Department, 6120 Trotman Drive, Montgomery, AL 36104
- Insurance Department, Fire Marshall, 201 Monroe Street - Suite 600, Montgomery, AL 36104
- Montgomery Fire Department - Information, Montgomery, AL 36104
- North Montgomery County VFD - Fire Department, 3670 Coosada Ferry Road, Montgomery, AL 36110
- Pintlala VOL Fire Department, Montgomery, AL 36104
- Waugh MT Meigs Volunteer Fire Department, 20 Line Creek Road, Montgomery, AL 36117

**Table Two: Montgomery Metro Communications Cooperative District**

Trunk Radio System: EDACS Narrowband TRS  
Mode: ProVoice and Analog

Site 1 Simulcast		Site 2 Red Level	
Freq (MHz)	LCN	Freq (MHz)	LCN
855.2125	01	856.2625	01
855.4875c	02	857.2625	02
856.4375	03	858.2625c	03
856.7125	04	859.2625	04
857.4375	05	860.2625	05
857.7125	06	Site 3 Montgomery	
858.4375	07		
858.7125	08	Freq (MHz)	LCN
856.2375	09	856.4625	01
856.7625	10	856.9625	02
857.2375	11	857.7375c	03
857.9375	12	858.9625	04
858.2375	13	859.9875	05
858.4625	14	OBSERVED SYSTEM TALKGROUPS	
858.7625	15		
859.4375	16		
859.7125c	17		

### OBSERVED SYSTEM TALKGROUPS

Note: Analog mode unless otherwise indicated.  
ProVoice talkgroups observed indicated by \*

### Talkgroup Usage

Montgomery County ...	
00-001	Fire Department patch to City Fire B*
02-041	Sheriff Dispatch
02-042	Sheriff Tactical
02-044	Sheriff Supervisors
02-047	Mutual Aid 3
02-056	Sheriff unknown usage
02-057	Sheriff Unknown usage
02-061	Sheriff Investigators 1
02-062	Sheriff Investigators 2
02-063	Sheriff Investigators 3
02-081	Sheriff Legal Services 1 - Warrant Office and Process Servers
02-082	Sheriff Legal Services 2
02-083	Sheriff Legal Services 3
02-102	Sheriff Special Operations Bureau
02-103	Sheriff Unknown usage
02-121	Courthouse Security 1
02-122	Courthouse Security 2
02-123	Courthouse Security 3
02-141	Detention Facility unknown usage

02-142 Detention Facility unknown usage  
 02-143 Detention Facility unknown usage  
 02-147 Sheriff Unknown usage  
 03-022 Sheriff Patrol 1 Car-to-Car  
 03-023 Sheriff Patrol 2 Car-to-Car  
 03-041 Fire South  
 03-042 Fire North  
 03-043 Fire West  
 03-044 Fire East

03-045 Pike Road Volunteer Fire Department  
 03-046 Snowdown Volunteer Fire Department  
 03-047 Waugh/Fort Meigs Volunteer Fire Department  
 03-050 Catoma Volunteer Fire Department  
 03-051 Pintala Volunteer Fire Department  
 03-052 Rolling Hills Lakes Volunteer Fire Department  
 03-053 North Montgomery County Volunteer Fire Departments  
 03-054 South Montgomery County Volunteer Fire Departments

#### Montgomery County...

03-081 Sheriff Training 1  
 03-082 Sheriff Training 2  
 03-083 Sheriff Training 3  
 03-103 Sheriff Unknown usage  
 03-141 Board of Education Security  
 03-142 Board of Education Security  
 03-145 Board of Education Security  
 03-146 Board of Education Security  
 03-147 Health Department

04-122 Mutual Aid 1  
 06-034 Disaster 1  
 06-035 Disaster 2  
 06-036 System Patch to State Net 155.010 MHz  
 06-037 Mutual Aid 4 (Montgomery Police Department Riverwalk Stadium detail units)

#### Troy University at Montgomery...

07-141 Unknown usage  
 07-142 Maintenance 1  
 07-143 Maintenance 2  
 07-144 Maintenance 3

#### Montgomery City...

07-145 Housing Authority Police\*  
 08-021 Services – Traffic Engineering 1\*  
 08-022 Services – Traffic Engineering 2\*  
 08-061 Services – Streets  
 08-081 Services – Sanitation  
 08-082 Services – Sanitation Administration  
 08-090 Services – Building Inspectors  
 10-020 Police Dispatch <Channel 1>  
 10-021 Police Unit-to-Unit\* <Channel 4>  
 10-041 Police Record Checks\* <Channel 2>  
 10-042 Police Car-to-Car\* <Channel 3>  
 10-043 Police Patrol Car-to-Car\* <Channel 5>  
 10-044 Police Accident Investigators\* <Channel 6>  
 10-045 Police Supervisors\* <Channel 7>  
 10-061 Police Detective Division\* 1  
 10-062 Police Juvenile Division\* 1  
 10-063 Police Special Operations\* 1  
 10-102 Police Special Operations\* 2  
 10-144 Police Special Detail\*  
 12-021 Fire Department Fire A Dispatch\*  
 12-022 Fire Department Fire B Tactical\*  
 12-023 Fire Department Unknown usage\*  
 12-024 Fire Department Unknown usage\*  
 12-025 Fire Department Unknown usage\*  
 12-026 Fire Department Unknown usage\*  
 12-027 Fire Department Fire Medics  
 12-041 Trunk Radio System - City Radio Technicians  
 12-103 Fire Department Fire Codes and Standards  
 13-141 Mutual Aid 2

Alabama Department of Public Safety...  
 14-020 DPS All Call  
 14-021 Headquarters  
 14-022 DPS Safety 1, Patch to 154.920 MHz (DPS VHF Dispatch DPS-2)  
 14-023 DPS Safety 2  
 14-024 DPS Safety 3  
 14-035 Protective Services Division Executive Protection Team  
 14-036 Protective Services Division Governor's Protection Detail  
 14-041 Protective Services Division Investigations-1  
 14-076 Protective Services Division Lt. Governor's Protection Detail  
 14-094 Protective Services Division Detail 1  
 14-095 Protective Services Division Detail 2  
 14-100 Alabama Highway Patrol – All Call  
 14-101 Alabama Highway Patrol – Patrol 1  
 14-102 Alabama Highway Patrol – Patrol 2  
 14-103 Alabama Highway Patrol – Patrol 3  
 14-117 Unknown usage  
 14-141 Unknown usage  
 14-142 Unknown usage

14-154 Trunk Radio System – State Radio Technicians  
 15-013 Trunk Radio System – Communications Engineering  
 15-055 Protective Services Division Capitol Police  
 15-070 Mutual Aid Calling  
 15-157 Trunk Radio System – Radio Technicians

### Table Three: Montgomery Police Department Radio Codes

PDF copy of the codes below at <http://montgomeryal.gov/media/659940/police%20radio%20codes.pdf>

3 Robbery/A=ATM or Bank; B=Business, P=Person/Residence  
 4 Burglary/B=Business; R=Residence; V=Vehicle;  
 5 Subject Killed  
 6 Subject Shot  
 7 Shots Fired  
 8 Subject with Gun  
 9 Fight in Progress  
 10 Investigate/A=Abduction; C=Child Abuse/Neglect; F=Found Property/Vehicle; J=Jumper; L=Lost or Abandoned 911 Call; M=Mischief to Property; P=Suspicious Person/Vehicle; S=Attempted Suicide; U=Unknown or Other  
 11 Alarm/A=Closed Bank or ATM; B=Business; K=Open Bank; R=Residence; T=Tracker  
 12 Disturbance/D=Domestic Violence; F=Family; M=Loud Music; U=Unknown/Other  
 13 Subject Dead  
 14 General Medical  
 15 Purse Snatching  
 16 Open Building  
 17 Pick up Prisoner  
 18 Lost Child  
 19 Missing Person  
 20 Prowler  
 21 Subject Down  
 22 Drunk in Public  
 23 Stolen Vehicle  
 24 Shoplifter  
 25 Accident/A=With Injury; B=With Injury – 18 Wheeler involved; C=Minor; E=With Entrapment; H=Hazardous Materials

26 Hit and Run/A=With Injury; B=With Injury – 18 Wheeler Involved; C=Minor; E=With Entrapment; H=Hazardous Materials  
 27 Traffic Violation  
 28 Parking Violation  
 29 Assist Motorist  
 30 Check Vehicle Blocking  
 31 Direct Traffic/F=FD; O=Other  
 32 Driver Intoxicated  
 33 Rape  
 34 Theft  
 35 Subject Cut/Stabbed (Intentional)  
 36 Follow Up Investigation  
 37 Court  
 38 Department Duties  
 39 Maintenance  
 40 Stray Dog/A=Instructional (AC use only); B=Instructional (AC use only); C=Instructional (AC use only); E=Instructional (AC use only)  
 43 Animal Bite (Specify)  
 77 Felony Warrant  
 88 Misdemeanor Warrant  
 89 Capias Warrant

#### DISPOSITIONS

51 Advise Given  
 52 Arrest Made  
 54 False Complaint  
 55 Report Made  
 56 No Report Necessary  
 57 Street Cleared  
 59 Unable to Locate  
 62 Warrant Advised  
 63 Citation Issued  
 64 Assignment Completed  
 65 Stray Dog Picked Up  
 66 Assisted Other Unit  
 71 Unit/Supv Canceled  
 72 Desk Canceled Unit  
 74 False Alarm – FANF Left  
 75 False Alarm – No FANF  
 76 False Alarm – Weather  
 99 Other Action Taken

#### TEN CODES

10-1 Receiving Poorly  
 10-2 Receiving Well  
 10-3 Stand By  
 10-4 Acknowledgment  
 10-5 Unit to Unit  
 10-6 Busy  
 10-7 Out of Service  
 10-8 In Service  
 10-9 Repeat  
 10-10 Out of Service - Break  
 10-11 Situation Under Control  
 10-12 Escort/Transport  
 10-13 Police Needed for Investigation  
 10-14 Ambulance Needed at this Location  
 10-15 Prisoner in Custody  
 10-16 Change Location to \_\_\_\_\_  
 10-17 Destination Reached  
 10-19 Cancel Assignment/Call  
 10-20 Advise Location  
 10-21 Any Traffic for Unit  
 10-22 No Traffic for Unit  
 10-23 Rendezvous with \_\_\_\_\_ at \_\_\_\_\_  
 10-25 Report in Person To  
 10-26 Disregard Last Traffic  
 10-28 Check Registration  
 10-29 Check Wanted/Stolen  
 10-33 Emergency Traffic  
 10-55 Bomb Threat  
 10-57 Request Arson Investigation  
 10-65 Calling Out of Service Unit  
 10-99 Fire Investigation  
 10-100 Need PD-FD Personnel in Danger  
 PX Telephone \_\_\_\_\_  
 00 (Double Zero) Officer Needs Help  
 00 (Double Zero) Officer Needs Help



# Scanning Lake Lanier

By John Mayson (KC4VJO)

*Glooms of the live-oaks, beautiful-braided and woven  
With intricate shades of the vines that myriad-cloven  
Clamber the forks of the multiform boughs,  
Emerald twilights,  
Virginal shy lights,  
Wrought of the leaves to allure to the whisper of vows,  
When lovers pace timidly down through the green colonnades  
Of the dim sweet woods, of the dear dark woods,  
Of the heavenly woods and glades,  
That run to the radiant marginal sand-beach within  
The wide sea-marshes of Glynn.*

- The Marshes of Glynn

**W**here at *Monitoring Times* thought we would share some classic poetry with you. "Why?!" you might ask. Isn't this fine publication enough culture for your average radio enthusiast? What could "vines that myriad-cloven" possibly have to do with radio?

Back in 1842 in Macon, Georgia, a boy was born. His parents named him Sidney. He attended Oglethorpe University, which was then located near Milledgeville, Georgia. He served in the Confederate signal corps during the Civil War. He then worked as a lawyer in his native Macon. But it was his love for music, writing, and poetry that inspired Sidney. He wrote a novel, a number of essays, and

poems during his short life. He died at the age of 39.

The state of Georgia has honored their native bard in two ways. They named a county in the southern part of the state after him. But most people are more familiar with Lake Sidney Lanier, better known simply as Lake Lanier, situated north of Atlanta. Created in 1956, Lake Lanier provides flood control for metro Atlanta, drinking water for three million people, including virtually everyone in sprawling Gwinnett County, and offers people from all over north Georgia relief from the southern summer heat.

The lake was created when the Buford Dam on the Chattahoochee River was completed. The lake covers nearly 60 square miles and provides nearly 700 miles of shoreline. It is maintained by the US Army Corps of Engineers (USACOE) and is patrolled by the Georgia Department of Natural Resources (DNR). The lake borders Hall, Forsyth, Dawson, and Gwinnett counties, all of which provide emergency services on the lake.

Over seven-and-a-half million people visit the lake each year, leaving no shortage of scanning opportunities. It hosts a water park, resort hotels, a golf course, and countless marinas. The lake received worldwide attention in 1996 when it served as a Summer Olympic venue.

Let's fire up our scanners and head to the lake.

## USACOE & DNR

The US Army Corps of Engineers and Georgia Department of Natural Resources are the two primaries on the lake. Any radio

traffic on their frequencies in this area will be lake related.

Freq	CTCSS	Description
165.0375	103.5	US Army Corps of Engineers
159.6000	151.4	Georgia Department of Natural Resources

## DAWSON COUNTY

Of the four counties adjacent to Lake Lanier, Dawson is the most rural. However, at the rate metro Atlanta is growing, don't expect it to be considered "rural" much longer. It borders the northwestern shore of the lake. Dawsonville is the county seat and home to NASCAR legend Bill Elliott.

The county relies on VHF conventional frequencies. If you want a taste of scanning this area you can visit

🔊 [www.ScanDawson.com](http://www.ScanDawson.com).

### Dawson County Frequencies

Frequency	CTCSS	Description
158.790	146.2	Dawson County Sheriff
154.400	110.9	Dawson County Fire
155.385		Dawson County EMS

## FORSYTH COUNTY

The population of this county has tripled in the past twenty years. The high cost of



One of the marinas along the lakeshore



Author waterskiing

living in Fulton County has driven many suburbanites northward into Forsyth. The county borders the western and southwestern shores of the lake.

Forsyth switched over to a digital trunked radio system (TRS). The metro Atlanta area has long used Motorola trunked radio systems, but the latest counties to switch are electing to use digital technology. This is quite a change when you consider the history of this county. It wasn't until the early 1980s that they even had a full-time fire department. Previously they relied on the Harold Glover family who volunteered their services. Today Forsyth County maintains a rescue boat on Lake Lanier.

You will need a digital trunk-tracking scanner to monitor Forsyth County. They use a Motorola APCO-25 compliant system.

#### Forsyth County TRS Frequencies

866.1000, 866.6500, 867.6625, 867.8625, 868.2750, 868.6000, 868.9875 MHz

#### Forsyth County TRS Talkgroups

Talkgroup	Description
2031	Forsyth County Fire Department Dispatch
2032	Forsyth County EMS Dispatch
2033	Forsyth County Fire Department
2034	Forsyth County Fire Department
2036	Forsyth County Fire Department Tactical (Central)
2038	Forsyth County Fire Department - TAC 9
2039	Forsyth County Fire Department
2047	Forsyth County Fire Department - Arson
2001	Forsyth County Sheriff Channel 1 North Dispatch
2002	Forsyth County Sheriff Channel 2 South Dispatch
2003	Forsyth County Sheriff Channel 3 North TAC
2004	Forsyth County Sheriff Channel 4 South TAC
2009	Forsyth County Sheriff
2016	Forsyth County Sheriff Jail
2048	Forsyth County Sheriff

#### Cumming Police Department

Talkgroup	Description
2061	Police Dispatch
2063	Police Tactical

## WINNETT COUNTY

As further testament to metro Atlanta's growth, Gwinnett County grew from 588,000 residents in 2000 to over 726,000 in 2005. That's an increase of nearly 138,000 people, or about 23%, in five short years. Gwinnett borders only a sliver of Lake Lanier, but relies wholly on the lake for its water and the Buford Dam lies within its boundaries.

Since this article is about scanning Lake Lanier and not about scanning metro Atlanta, we're not going to cover the county in great detail. Gwinnett has a number of rescue teams they can use for any work on the lake. If you plan to visit the Atlanta area and wish to know more about scanning, I highly recommend visiting [www.ScanAtlanta.com](http://www.ScanAtlanta.com). Michael Martin and his team of volunteers have put a lot of effort into this site and it's one of the best radio related websites. Don't forget about Lindsay Blanton's [www.RadioReference.com](http://www.RadioReference.com), another excellent resource.

[www.ScanGwinnett.com](http://www.ScanGwinnett.com)

Be sure to visit [www.ScanGwinnett.com](http://www.ScanGwinnett.com) to tune in this exciting county from around the world.

#### Gwinnett County TRS Frequencies

854.7875, 854.8125, 854.8375, 855.3125, 855.4875, 855.7625, 855.7875, 855.8125, 856.8125, 856.8375, 856.9125, 857.8125, 857.8375, 857.9125, 858.7875, 858.8125, 866.1375, 866.3875, 867.3875, 867.9625, 868.1375, 868.4875 MHz

#### Gwinnett County TRS Talkgroups

Talkgroup	Description
48	Gwinnett County Fire Dispatch
80	Gwinnett County Fire TAC 7
112	Gwinnett County Fire TAC 8
144	Gwinnett County Fire TAC 2
176	Gwinnett County Fire TAC 3
208	Gwinnett County Fire TAC 4
240	Gwinnett County Fire TAC 5
272	Gwinnett County Fire TAC 6
304	Gwinnett County EMS 1
336	Gwinnett County EMS 2
368	Gwinnett County Fire Command
400	Gwinnett County Fire Admin/Inspections
432	Gwinnett County Fire TAC 9
464	Gwinnett County Fire TAC 10
496	Gwinnett County Fire TAC 11
528	All County
1648	Gwinnett County Police Ch 1 West
1680	Gwinnett County Police Ch 2 South
1712	Gwinnett County Police Ch 3 North
1744	Gwinnett County Police Ch 4 East
1776	Gwinnett County Police CID
1808	Gwinnett County Police TAC 1
1840	Gwinnett County Police TAC 2
1872	Gwinnett County Police TAC 3
1904	Gwinnett County Police TAC 4
1936	Gwinnett County Police TAC 5
1968	Gwinnett County Police Ch 5 Central
2000	Gwinnett County Police Command

## HALL COUNTY

*Out of the hills of Habersham,  
Down the valleys of Hall,  
I hurry a main to reach the plain,  
Run the rapid and leap the fall,  
Split at the rock and together again.*

Yes, we're treating you to more refrains from Sidney Lanier, this time from his poem *Song of the Chattahoochee* that describes the Chattahoochee River's meandering into Hall County. Lake Lanier Islands and countless marinas lie in Hall County. It's the county most associated with the lake. If you program anything into your scanner, it should be Hall County. However...

Hall county recently switched to a digital trunked radio system and unfortunately for us it's mostly encrypted. All law enforcement talkgroups are encrypted. Fire and EMS dispatches are in the clear, but responses are encrypted. At a minimum you'll hear about any rescue or medical calls on the lake. You just will not be able to monitor any responses.

We here at *Monitoring Times* are puzzled as to why any agency would want to encrypt all of their communications. Do they have something to hide? A common response to the question is responder safety, particularly law enforcement. Remember though, encryption causes far worse problems than just losing the eyes and ears of the law-abiding, scanner-owning citizens. Sheriff's deputies and fire crews from adjacent counties will enter into mutual aid calls in Hall County completely blind. Hearing information third-hand from their own dispatcher isn't the same as hearing it for themselves as the situation unfolds.

Not heading up to the lake anytime soon?

Just point your web browser to

[www.ScanHallCounty.com](http://www.ScanHallCounty.com) and enjoy.

#### Hall County

##### Frequencies

854.3875, 854.9625, 866.1750, 866.4125, 866.6000, 866.9500, 867.3000, 867.5875, 867.8375, 867.9125, 868.41250 MHz

#### Hall County Sheriff

Talkgroup	Description
5001	North Patrol
5002	South Patrol
5008	North Ops
5017	South Tactical
5061	Ops
5119	Hall County Jail
5120	Hall County Corrections
5121	Hall County Corrections

#### Hall County Fire/EMS

Talkgroup	Description
5031	Fire/EMS Dispatch
5033	Fire Tactical



Author passing time on the boat

#### Gainesville Police Department

##### Talkgroup Description

5061 Dispatch  
See You at the Lake

Whether you're a boater, a beach bum, a golfer, or a fisherman, Lake Lanier and its surrounding amenities are guaranteed to keep you entertained. Just make sure you toss your scanner into your golf bag or pack it with the beach towels before you go.

*Sidney Lanier's poems are in the public domain.*



# Reliving World War II via Radio

By Eric Beheim

**B**etween 1939 and 1945, most Americans relied on radio to stay informed about the latest developments of World War II. Whenever a major battle was being fought or the President spoke to the nation, everyone remained glued to their radio sets. Many listeners even went so far as to keep maps of the major battlefronts of the world close at hand, so that they could quickly locate the places that war correspondents and military analysts were discussing. (This writer's grandfather updated his maps using colored pins while listening to a Philco Model 40-195 XX console radio.)

Recognizing the historical value of their wartime broadcasts, the major networks and some of their larger affiliates often transcribed them. Heard today, these recordings still have the power to give listeners a sense of the here and now, as dramatic events are described, often while they were taking place.

For those listeners whose tastes run to news and commentary from radio's "golden age," a wealth of World War II material is currently available. For only a modest investment, a collection in the MP3 format, for example, can be acquired that is extensive enough to allow you to follow the progress of the war on a week-by-week, and in some cases, hour-by-hour basis.

Hearing the war unfold in near-real time is quite a different experience from reading about it! Listening to radio news reports from the war years, it is possible to sense some of the tension and apprehension that came from not knowing for certain what the final cost of victory would be.

A search of the internet will turn up the websites of those dealers in old time radio



*As the first portable radio to have shortwave bands, Zenith's Model 7G605 Trans-Oceanic "Clipper" proved an instant success with military personnel serving abroad. (The four-engine bomber embroidered on the speaker grille cloth was added after Pearl Harbor.)*

*An advertisement for the Zenith 7G605 Trans-Oceanic Clipper. (The bomber design on the speaker grille cloth dates this ad from sometime after Pearl Harbor.)*

programs who have World War II material available for sale. On-line auction sites such as eBay are also good places to search. Here is a list of some of the collections that I've found to be particularly worthwhile listening.

## THE WJSV BROADCAST DAY

On September 21, 1939 (three weeks after war had been declared in Europe), President Franklin D. Roosevelt called a special session of Congress to ask for changes to the country's neutrality laws to allow the sale of arms and munitions to warring nations on a "cash and carry" basis. Partially as a result of this momentous occasion, CBS's Washington D.C. affiliate WJSV (today's WTOP) transcribed its entire broadcast day - from sign-on at 5:58 a.m. until sign-off at 1:00 a.m. the following day - for the National Archives.

The program schedule included recorded music hosted by Arthur Godfrey, news programs, soap operas, the special session of Congress, a baseball game between the Washington Senators and the Cleveland Indians, *Amos 'n Andy*, Elmer Davis' news commentary on the situation in Europe, quiz shows, *Major Bowe's Amateur Hour* (one of radio's most listened to programs back

then), the *Columbia Radio Workshop*, more news commentary, a repeat of the President's speech from earlier in the day, broadcasts by "name bands" such as Teddy Powell, Jerry Livingston and Louis Prima, etc.

Available inexpensively on a single MP3 disc, it is something that anybody interested in what radio was like during its "golden age" will enjoy listening to.

## ELMER DAVIS AND THE NEWS

During the opening months of the war, CBS commentator Elmer Davis provided a daily 5-minute summary and analysis of important events that had occurred that day in Europe and Asia. Even though America was not yet involved in the war, many realized that what was happening "over there" would eventually affect them as well, and therefore tuned into Davis' program to stay current on the deepening crisis. Seventy-four of his broadcasts are available on a single MP3 disc. They provide an almost day-by-day look at how the war was initially fought in Europe, when both Germany and Soviet Russia were actively engaging in naked aggression against their smaller neighbors.





*The author's personal broadcasting facility consisting of a low-power, limited-range AM transmitter plus MP3, CD, and audio cassette players and a Radio Shack audio selector. From here, replays of Golden Age radio material can be broadcast to an assortment of vintage radios scattered around his house.*

### "THIS IS LONDON"

Fifty-six of the reports that Edward R. Murrow made to American radio listeners from London via shortwave radio between 1939 and 1946 are available on an MP3 disc. Many of his reports from late 1939 and 1940 describe how the average British citizen was bearing up under the pressures of war-time shortages, blackouts, air raids, and so on. One particularly memorable broadcast is Murrow's report from December 3, 1943, where he describes his experiences while accompanying the crew of Royal Air Force bomber "D-Dog" during a nighttime bombing raid over Berlin. Almost 65 years after it aired, it remains an example of radio reporting at its finest!

### WILLIAM L. SHIRER

Twenty news programs hosted by veteran CBS newsmen William L. Shirer between 1938 and 1944 are available on a single MP3 disc. One of the highlights is Shirer's eyewitness account



*A few of the titles in the writer's collection of World War II radio programs. Compressed into MP3 audio files, hours and hours of news and commentary can be squeezed onto a single CD-R.*

of France's surrender to Germany on June 21, 1940, on the same spot and in the same railroad car where Germany had surrendered to the Allies at the end of World War I.

### THE DEBATE OVER AMERICAN NEUTRALITY

Even before war broke out in Europe, most Americans were opposed to the U.S. becoming involved in another foreign war. One of the most prominent (and controversial) figures to speak out in favor of American neutrality was Father Charles E. Coughlin, "The Radio Priest" who first took to the airwaves in 1926. A charismatic and gifted public speaker, Coughlin's weekly discussions on politics and economics were heard by millions of Americans of all faiths.

By 1939, when it became apparent that war in Europe was inevitable, Coughlin began to speak out against what he saw as a plot by the British, the "International Bankers," and the Roosevelt administration to draw the U.S. into the coming conflict. (One of his broadcasts was a rebuttal to FDR's speech to Congress about changing the neutrality laws.)

Although some of Coughlin's political beliefs are still considered objectionable by many, he was an important figure in the history of broadcasting. Many of his wartime programs from 1939 and 1940 are available on audiocassettes and MP3 discs.

### DAY OF INFAMY

Any further debate over whether or not America should remain neutral came to an abrupt end on Sunday, December 7, 1941 with the surprise attack on the Pearl Harbor Naval Base in Hawaii.

Reflecting the uncertainty and confusion of that day, radio's coverage of December 7<sup>th</sup> consisted primarily of short bulletins and some (understandably) uninformed commentary and analysis. Pearl Harbor radio programs are available from a number of different sources.

One of the most interesting collections (and this writer's personal favorite) is a set of six audio CDs sold by a company called *Radio Revisited*, which was acquired on eBay. Covering most of the broadcast day, it includes – in addition to commentary from the likes of Drew Pearson, H.V. Kaltenborn and the correspondents on CBS' *World News Today* – extended excerpts from regularly scheduled programs (everything from *Chats About Dogs* to *American Album of Familiar Music*) that were interrupted by announcements updating listeners on the attack.

### THE ULTIMATE WORLD WAR II COLLECTION

Dollar for dollar, the *best* collection of historic World War II radio material is contained on a single MP3 DVD entitled *WWII: AN ALLIED AUDIO HISTORY*, sold by an outfit called *Earthstation.com* and available through eBay. It consists of some 63 hours of audio dating from 1938 to 1945 and includes many items not found in the other collections mentioned here. Its 273 audio files, lasting anywhere from a few seconds (the BBC's German Service theme song) to an hour or more (live coverage of V-E Day speeches



*This DVD-R contains 273 MP3 audio files holding about 63 hours worth of World War II radio material originally broadcast between 1938 and 1945.*

and celebrations), provide a priceless sampling of what was heard on radio during the war years. Here is just an inkling of what it contains:

- Complete coverage of the special session of Congress that took place on December 8, 1941, where FDR delivered his famous "Day of Infamy" speech prior to lawmakers voting to declare war on Germany and Japan
- Eyewitness accounts of the Battle of Midway
- "Home Front" news delivered by such commentators as Fulton Lewis, Gabriel Heatter, and Walter Winchell
- An American POW's account of the Bataan Death March
- General MacArthur's "I have returned" speech
- A tribute to Ernie Pyle (the famous war correspondent killed in action in 1945)
- Live Coverage of V-E Day speeches and celebrations
- Live Coverage of V-J Day speeches and celebrations

Its chief disadvantage is that its 273 files are organized alphabetically by title rather than by date. To make them more "user friendly," this writer found it convenient to take the time to sort the files according to their original broadcast dates and then recopy them onto separate disks, one for each year of the war.

### CBS WORLD NEWS TODAY

Airing every Sunday afternoon, CBS's *World News Today* offered 30 minutes of the latest war news and analysis. Each broadcast featured one or more shortwave reports from CBS correspondents serving in different battle theaters around the world. Sometimes these reports had to be cancelled or cut short due to poor reception conditions or enemy jamming! (You can read an abbreviated version of notes my grandfather made while listening to these broadcasts: Just click on the key at [www.monitoringtimes.com](http://www.monitoringtimes.com) and enter this month's password.)

CBS's chief military analyst, Major George Fielding Elliott, was often on hand to comment on the current military situation. In addition, each program usually featured interviews with someone directly involved in the war effort: the commanding officer of the American camp in Tennessee where German and Italian POWs



were being held; the commandant of the U.S. Army's Ranger School in Hawaii, the crew of a Liberator bomber that had recently participated in an important raid over enemy-held territory, etc. (Although the voices were undoubtedly genuine, many of those interviewed sounded like they were reading from a script.)

The program was sponsored by the Chicago-based Continental Radio and Television Corporation, makers of Admiral radios. Since no new consumer radios were produced during the war, the commercials mostly described the role that Admiral was playing in helping to supply radio equipment to the war effort.

Eighty-eight broadcasts dating from late November 1942 until the end of the war are available on a single MP3 disc. Despite some gaps in the program sequence, this collection provides one of the most complete looks at how the war progressed from late 1942 until its conclusion in 1945.

## D-DAY

Early on the morning of June 6, 1944, just as most East Coast radio stations were signing off the air, Germany's international shortwave service reported that the Allies' long-expected invasion of Hitler's "Fortress Europe" had begun with landings along the northern coast of France. CBS immediately alerted all of its affiliate stations that it was now providing continuous news coverage of what everyone knew would be one of the most listened-to broadcast days in the history of radio.

At first, the only available news was what little could be picked up from German radio. Later in the morning, official confirmation of the invasion was received from the Supreme Headquarters of the Allied Expeditionary Force (SHAEF) in England. As the day continued, more shortwave reports were received from correspondents in London, some of whom had just returned from having observed the first waves of troops being landed ashore. (Wright Bryant's account of riding onboard a transport plane that delivered airborne troops to France is almost as riveting as Edward R. Murrow's 1943 account of his experiences onboard "D-Dog.")

Even after the networks resumed their regularly scheduled programs, there were frequent interruptions for news updates. That night, President Roosevelt spoke to the nation and then led a prayer for the troops. Most of the June 6, 1944 broadcast day was transcribed and is available from a number of different dealers. Some collections only offer highlights of the day's coverage, while others are extensive enough so that the listener can follow "the longest day" beginning when the first announcements were picked up from Germany, and continuing right on through until midnight.

## COMMAND PERFORMANCE

No collection of World War II radio programs would be complete without some examples of *Command Performance*, the spectacular, 60 minute variety show produced weekly by the War Department for direct shortwave transmission to troops fighting overseas. All of the top entertainers of the day appeared on it, and yet it had no budget and no one was paid. All talent



*A few of the World War II reference books that the author keeps handy while listening to replays of war news and commentary dating from 1939 to 1945.*

was donated, including the production staff. Both CBS and NBC made their studio facilities available at no charge.

The program's basic premise was that the servicemen themselves would write in and "command" who and what they wanted to hear. It was not uncommon for the likes of Bing Crosby, Bob Hope, the Andrews Sisters, Red Skelton, Edgar Bergen, Ethel Waters, Spike Jones, Dinah Shore, Kay Kyser, and Charles Laughton to all appear on same broadcast. Eventually production had to be shifted to Los Angeles to accommodate the flood of requests for appearances by Hollywood screen stars.

A number of *Command Performance* programs are available for sale. There are even on-line program logs that identify the entertainers and movie stars who appeared on specific broadcasts.

## THE WEAF BROADCAST DAY

On August 10, 1945, when news was received that Japan had started taking steps to submit a formal surrender offer, radio station WEAF in New York City began transcribing its broadcast day. Since the surrender offer still had not been officially received by the U.S. Government, it soon became obvious that this would not be VJ-Day, and WEAF eventually returned to its regularly scheduled programs, which it continued to transcribe. As a result, about 9 hours of a typical WEAF broadcast day in 1945 were preserved for posterity. Available inexpensively on a single MP3 disc, it provides still more interesting listening for anybody who wants to know what radio was like during its "golden age."

## THE RADIO THAT HELPED TO WIN THE WAR

If there is one radio that is closely associated with World War II, it is Zenith's Model 7G605, the Trans-Oceanic "Clipper". Introduced only days after Pearl Harbor, the Clipper was not only the first Trans-Oceanic, but also the first portable radio to offer shortwave bands. Only about 35,000 of them were made before Zenith stopped producing consumer radios in order to do war work for the U.S. Government.

Even though they sold for the relatively high price of \$75 (the equivalent of \$934 in today's dollars!) many Clippers were bought

by U.S. military personnel, who took them into battle zones around the world. Zenith soon began receiving letters telling of Clippers that had been subjected to extreme tropical heat and humidity, sand storms, enemy bombardments, being dropped into the surf during amphibious landings, and all manner of rough treatment, and had still continued to work. In many of the out-of-the-way places where U.S. troops found themselves, someone's personal Clipper was often the only means of getting news and entertainment from back home.

With no new Clippers available at any price, considerable ingenuity was used to keep these deployed sets operational. Zenith files contain an account of one Clipper that was successfully repaired using parts salvaged from captured enemy radio equipment. It is probably safe to say that, wherever U.S. troops served during the war, a Clipper or two was also there, serving along with them.

Perhaps this explains why a restored Zenith Trans-Oceanic Clipper is one of this writer's personal favorites from among a modest collection of vintage radios. It is also the radio that he most often uses when listening to replays of World War II news and commentary. (Like many collectors of antique radios, I use a low-power, limited-range AM transmitter to broadcast recorded programs to the various sets I have scattered around the house.) I don't know for sure if my Clipper is a combat veteran or if it even left the United States during the war years. However, it is not too hard to imagine that many of these same war-time programs were probably received on it back when they originally aired.

Listening to radio's coverage of World War II does not have to be a passive experience. Quite often, these programs come from the seller with little or no specific information as to content. I have found it convenient (and more than a little fun) to jot down this information in a notebook while listening to them. Coming up with original broadcast dates can also be an interesting challenge. During one undated news broadcast, the commentator, while waiting for an overseas shortwave report, mentions in passing the terrible fire that had occurred the night before at the Cocoanut Grove nightclub in Boston. A little research turned up that the Cocoanut Grove fire had occurred on Saturday, 11/28/42, so the broadcast date had to be Sunday, 11/29/42. Other program dates were arrived at using similar detective work.

This has been just a brief look at what is available in the way of radio news and commentary from World War II. Whether you're a military buff, a fan of Golden Age Radio, or just interested in hearing how breaking news was reported back before television and 24/7 cable news, I think that you will find these programs to be every bit as fascinating as anything you're likely to tune in today.

Happy listening.

## About the Author:

Eric Beheim is a life-long radio enthusiast. A former commanding officer of a Naval Reserve Combat Camera unit based in San Diego, he and his wife Pat live in Southern California. You can e-mail him at [quondam32346@aol.com](mailto:quondam32346@aol.com).

**Q.** What is happening to TV signals and standard TV sets on February 17, 2009? (Several inquiries)

**A.** February 17, 2009, is the cutoff date set by the FCC for conventional, analog TV broadcasts in the traditional channels 2-69 VHF/UHF spectrum. While off-air television transmissions will continue there, they will be digital and unreceivable on your present TV set unless it's digitally-equipped.

If you don't want to upgrade to a new TV set, you can get a \$40 federal rebate on purchasing a digital-to-analog converter so you can continue to watch VHF/UHF local TV stations on your present set (call 888-DTV-2009). Only VHF/UHF broadcasts are affected, not satellite or cable. Thus, as of February 17, 2009, if you are watching local TV channels 2-69 on an older TV attached to a conventional antenna, your reception will go "poof."

**Q.** What frequency ranges are occupied by the new Digital TV channels? Will stations now carrying digital and analog on two channels keep a second digital channel? (John Demmitt, Somerset, PA)

**A.** The new DTV channels are simply re-assigned spectrum taken from the present analog TV channels 2-69. DTV multiplexes several different programs simultaneously; you choose a "major" (conventional) channel number, then a specific program sub-channel, as in 2-1, 2-2, 2-3, etc. up to -99. Data channels are numbered -100 to -199.

An excellent FCC primer on DTV may be found at: [www.dtv.gov/consumercorner.html](http://www.dtv.gov/consumercorner.html), and MT has also covered the topic in past feature articles and several columns, most recently in the June *Beginners Corner*.

**Q.** I often listen to two-way voice communications between the TV frequencies on my AM/FM/TV-sound portable radios. With digital TV replacing analog TV sound in the 700 MHz range, what will I hear there? (Ben-Nye, Westbury, NY)

**A.** Not much. Digital TV sound is not receivable on conventional analog receivers or scanners, and the newly-allocated public safety services in the 700 MHz range will be using digital audio as well. Your only hope is to get a scanner with P-25 demodulation capability; this will be the dominant public safety mode to ensure interoperability among licensees.

**Q.** Early, tube-type radios of the 1930s and '40s often had shortwave bands, with police communications just above the AM broadcast band. Was listening very popular then? (J.J.O., NC)

**A.** With no FM, TV, scanners or other alternatives back then, many listeners would attach a long wire aerial to the screw terminal on the back of their sets to hear worldwide broadcasts. I can still remember listening on my Philco cathedral to police calls in the 1.7 MHz spectrum as well as to shortwave broadcasting.

The allure of hearing utility communications was no more pervasive then than it is now, but more folks listened to foreign broadcasts like the BBC. Of course, we do this daily now with computers and television.

**Q.** I am presently using two indoor shortwave antennas and am plagued by electrical noise. Will a preselector help? (Paul Weiss, Phoenixville, PA)

**A.** Not likely. Since electrical interference is broadband, the noise is actually on your desired frequency (as well as others) and needs to be minimized by other means, such as switching to an outdoor antenna away from power lines, using a phase-type noise filter like the MFJ-1026, or a DSP noise filter like the MFJ-784B.

**Q.** Is there a general formula for determining the listening distance for a scanner? (Dave Carter, Centralia, IL)

**A.** Yes, but it's approximate because of the many factors that limit range, such as frequency, weather, terrain, cable losses, obstructions, tower height, transmitter power, antenna locations, antenna gain, and receiver sensitivity.

The visual horizon in miles between two antennas (or from your eyes to the horizon line) is found by taking the square root of  $(1.35 \times A)$ , where A is the combined height in feet of the two antennas (or the height of your eyes above the ground). Since radio waves bend somewhat toward the earth, the actual radio range is considerably greater than this calculation shows.

Where an outdoor, omnidirectional receiving antenna and low-loss cable are used, terrain is reasonably flat, and the transmitter operates at 100 watts or so, your scanner should be able to hear mobiles 15-25 miles away, and base stations 50-75 miles away. Adding a directional beam can increase this to 75-100 miles.

**Q.** How did early radio networks share the programming when telephone lines had poor quality? (J.J.O., NC)

**A.** During the 1920s, networking became the rage and it was, indeed, done over telephone lines. If this was impractical, stations could re-broadcast received signals from another station, or delay the program by playing phonograph recordings (16" celluloid-coated aluminum discs played at 78 RPM).

**Q.** While listening to air traffic in the 118-137 MHz band, I occasionally hear reference to a "squawk frequency"; what is that and what is it used for? (George Santulli, Washington, D.C.)

**A.** "Squawk" is simply the reference to activating a radar-frequency transponder that will distinguish a particular aircraft on a busy radar screen. If the aircraft pilot responds to "Squawk 7441," that simply means he will press that series of numerals which will identify which blip is his on the tower radar screen. It can also notify the Collision Avoidance System on other aircraft.

**Q.** Since birds can sit on a power line without getting electrocuted, can humans do the same? (Mark Burns, Terre Haute, IN)

**A.** Theoretically, yes, at least on the secondary, lower-voltage, distribution lines, and making good contact with the wire to prevent arcing. For current to flow, there must be a voltage difference in a closed circuit. Someone sitting on a power line doesn't complete an electrical path. But don't try it!

We've all seen the picture of a woman sitting on a metal chair connected to one pole of a high-voltage Tesla coil, her hair stretched out like a giant broom, each strand repelling the other because they are of the same polarity. She is unharmed because she doesn't complete an electric circuit, and only minor currents are present in the ionized air around her.

Questions or tips sent to Ask Bob, c/o MT are printed in this column as space permits. Mail your questions along with a self-addressed stamped envelope in care of MT, or e-mail to [bobgrove@monitoringtimes.com](mailto:bobgrove@monitoringtimes.com). (Please include your name and address.)



## Off-the-Shelf Antenna Building Supplies

**S**tore-bought antennas are getting more expensive each year. The price of stock aluminum, higher wages for Asian workers, higher costs for transportation, and general inflation have driven up the prices on all types of antennas. But, most antennas are made of aluminum and the basic building materials for antennas, both square and round tubing, are still relatively cheap. For your next antenna project consider buying tubing and doing it yourself.

### ❖ Haunting Hardware Stores

One of my favorite antenna supply sites is Tractor Supply Co., found in most towns across America. Here you'll find everything from miles of aluminum wire for Beverage and Rhombic antenna projects to all sorts of insulators: plastic, ceramic, post-mounted, or tree-mounted. They also have lots of other goodies aimed at farmers but very useful to radio experimenters. For example, small solar panel arrays which are used to power electric fences can also be used to power small 10 meter beacon transmitters or QRP stations. Check out the TSC home page ([www.tractorsupply.com](http://www.tractorsupply.com)) and look for things you can use for your next radio project.



*Tractor Supply is my source for any long-wire antenna project. You can choose from different gauges of aluminum wire. While the smaller gauge wire is cheaper for much longer runs, it breaks much easier. Here's a 12.5 gauge, 1,000' wire you can use for a Beverage antenna for under \$50! (Courtesy: Tractor Supply Co.)*

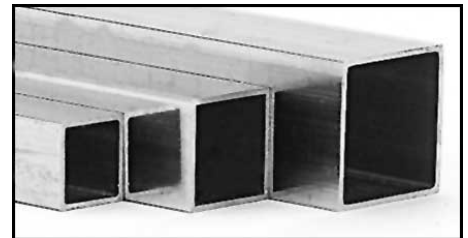
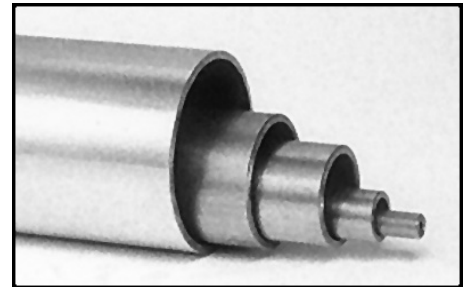
I recently found out that my local TrueValue hardware store carries the exact kind of square

aluminum tubing that's found on commercially made TV and FM antennas. It's easy to splice two 4-foot long square tubes to make an 8-foot boom to form the basis for your own DX FM or UHF-TV antenna. They also have a variety of sizes of aluminum rod which are perfect for making the elements for UHF or FM antennas, as well as making replacements for broken elements on store-bought UHF/FM/VHF or even 2 meter antennas.

Another nearby hardware store carries much longer (4, 6, and even 8 foot lengths) of round aluminum tubing of varying thicknesses that can be combined to make rotatable dipoles or small two or three element mono-band Yagi antennas for six meters or even 10 meter operations. Using extra-small hose clamps, you can use the different diameter tubes to build out telescoping elements for a three element mono-band Yagi for 12 or 17 meters. Using a hacksaw to cut a slit several inches long across each end lets you slip the small tube within the larger tube and clamp it secure.

Look around the store for things that can be converted to use in antenna building. For instance, look for a short fiberglass handle just the size of the inside diameter of the tubing you want to use for the driven element on your antenna project. It could be used as the insulator to keep the two halves of the driven element separate. Make sure it's long enough to be able to support the weight of the elements. The beauty of making mono-band antennas is that you don't need traps, as in multi-band Yagis, or fancy connectors, as in log periodic dipole arrays.

If you're not lucky enough to have a decent supply of antenna parts at your local hardware store, try **SmallParts.com**, a company that sells all sorts of widths, lengths and thicknesses of aluminum tubing both square and round. Having to pay shipping will add to the expense, but your DIY antenna project will still be cheaper



*If your local hardware store doesn't stock the aluminum tubing you need for your next antenna project, try **SmallParts.com**. They have round tubing from 1/4" to 3" diameter and up to 72" long. Their square tubing ranges from 1/2" to 2" and up to 72" long. (Courtesy: **SmallParts.com**)*

than buying one ready-made.

Having a three element Yagi mono-band antenna is better than using an amplifier, because it gives you a big on-air signal, hears as well as it sends, and costs nothing to operate. Building it yourself can save hundreds of dollars, and it also gives you tremendous "on-air cred" to say, "Antenna here is a home-brew three element Yagi mono-bander."

### ❖ Other Supply Options

Now, I'll admit that some of the more esoteric radio antenna supplies just can't be found at your local hardware store. So, you'll have to go to a radio specialty store to get those parts. Here are some companies that have hard-to-find radio antenna parts you may not be able to find anywhere else.

Antenna baluns are used on a number of ham and shortwave wire antennas. My favorite "all-band" shortwave antenna (which is also a dynamite 80-10 meters ham antenna) uses a 4:1 balun to be able to change from 300 ohm twin lead to 50 ohm coax cable as the lead-in. Universal Radio ([www.universal-radio.com](http://www.universal-radio.com)) stocks a number of baluns, including the 4:1



*Screw-in ceramic insulators like this from **Tractor Supply** can help you put up a Beverage through the woods or hang a Rhombic in no time. They'll last for years and cost less than \$2 each. (Courtesy: **Tractor Supply Co.**)*

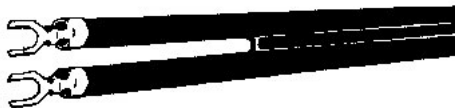
(\$25) and 1:1 (\$26) balun.

Try Universal Radio for your lead-in needs as well. They have 300 and 450 ohm ladder line on 100 foot spools: both are \$16.95 for 100 foot spools. They also have all manner of coax cable in various grades and impedance at reasonable prices. Sure, it's not as convenient as your local Radio Shack, but when was the last time you found what you were looking for there?

Another antenna part you won't find at Tractor Supply is the standard dipole center insulator, such as the one from Unadilla. It lets you attach the two legs of your dipole (that you cut to whatever band you need) and lets you attach a 50 ohm lead-in directly via the SO-239 input. It's just \$11 from Universal Radio. You can also contact Universal Radio by phone at 800-431-3939.

The center connector I find the most useful, particularly in making the all-band antenna mentioned earlier, is from Hy-Gain ([www.hy-gain.com](http://www.hy-gain.com)), the C-1 "Center Insulator for dipole antennas" is \$29.95 and takes a 300 or 450 ohm feed line. They also make one with an SO-239 for a 50 ohm feed line for the same price. You can contact Hy-Gain by phone at 800-973-6572.

It's gotten much harder to find a quality 300 ohm twin lead-in now that most TV's use 75 ohm coax connectors. Radio Shack's 300 ohm offering is probably the worst available. A better bet is Channel Master 300 ohm lead-in available from Stark Electronic ([www.starkelectronic.com](http://www.starkelectronic.com)), in Worcester, Massachusetts. This is "20 gauge, 7 strand, pure copper conductor, twin lead in a black poly jacket," as they say on their web page. They'll cut Channel Master 300 ohm twin-lead to your length for 10 cents/foot or you can buy it in a 500 foot roll for \$59 plus shipping. Call them at 508-756-7136 for more information or to make an order. They're open from 8:30-5:00 pm ET. I've bought a few things from them and have had excellent service.



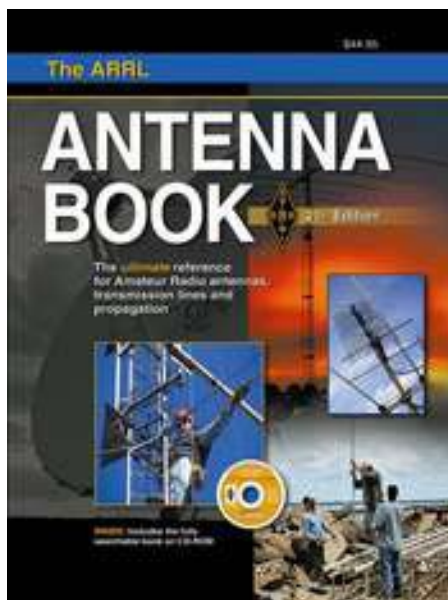
*Quality 300 ohm twin lead-in antenna wire is harder and harder to find. Channel Master brand 300 ohm twin-lead is available from Stark Electronic. (Courtesy: Stark Electronic)*

## ❖ Antenna Plans and Ideas

But, what to build? Depending on the type of radio work you do or want to do, you'll need some instruction or at least some inspiration.



*This 4:1 balun is essential to building the Grove Tunerless All-Band antenna, a low noise HF wire antenna I've used for 20 years to work the world (instructions in the MT online Reference Library). The balun is only \$25 from Universal Radio. (Courtesy: Universal Radio)*



*Every antenna project you can imagine and more are found here: ARRL's Antenna Handbook. It's less than \$50 and will last a lifetime! (Courtesy: American Radio Relay League)*

The antenna column in *Monitoring Times* and articles on its website provide some of both. There are many books available at various radio mail order outlets that delve into the many types of antennas used in both ham and shortwave listening. While there are several books specializing in one or more antennas, your excursion into the radio hobby may last a long time and take you to totally different regions of the hobby. You will need a book that can help you grow from beginner to seasoned veteran.

The mother lode of antenna projects is found at the American Radio Relay League (ARRL) and it's called the *ARRL Antenna Handbook*. The latest is the 21<sup>st</sup> edition and includes a CD ROM version in its entirety that lets you print articles directly from the disk. You get the low-down on long-wire, loops, Yagis, multi-band, mono-band, log-periodic dipole arrays, quad-arrays, transmission lines, you name it! And, it's just \$45. On the surface that may seem like a lot of money. But, it's not something you need to buy often. If you only buy one every 10 years, that works out to just \$4.50/year for instant access to antenna data that doesn't change every year. As a beginner in ham radio, it could be the single most important book you have in your shack. And, short-wave listeners can really benefit from the information and plans found in this handbook.



*This 10 watt .7 amp solar panel measures 30" x 15," is weather-proof, has a blocking diode, aluminum frame with mounting bracket and comes with battery clamp all for \$77. It's on the shelf at TSC! (Courtesy: Tractor Supply Co.)*

There are many parts to this book that you may never actually look at. That's okay. You have no idea where your radio hobby will take you, and, while your interests right now may be monitoring shortwave or scanner frequencies, there may come a time when you'll need to know something about tuning into ham satellites or direction finding antennas or what to use for antenna supports. These are just a few of the topics covered in the *ARRL Antenna Handbook*. There's even a section on antenna materials and accessories.

Even if the antennas you want to build aren't specifically covered in the text, you'll get the basic antenna building information: the formula of frequency-to-length used in wire and aluminum dipoles; horizontal or vertical multi-element antennas; spacing distances on multi-element antennas for all bands; circularly polarized UHF antennas for amateur satellite or weather satellite reception, and much more.

## ❖ What Are Your Secrets?

Of course, these are just a few of the places that have off-the-shelf antenna items available. You may have your own favorites, in which case I hope you'll share your antenna building secrets with the rest of us. Let me know what you've built, how you built it and where you went for parts. The rest of us really want to know!

## RESOURCES

### ARRL Antenna Handbook

[www.arrl.org](http://www.arrl.org)  
860-594-0200 or 1-888-277-5289

### Hy-Gain Antennas

[www.hy-gain.com](http://www.hy-gain.com)  
800-973-6572 or 662-323-9538

### Small Parts

[www.smallparts.com](http://www.smallparts.com)  
800-220-4242

### Stark Electronic

[www.starkelectronic.com](http://www.starkelectronic.com)  
508-756-7136

### Tractor Supply Company

[www.tractorsupply.com](http://www.tractorsupply.com)  
877-872-7721

### True Value Hardware store finder

[www.truevalue.com](http://www.truevalue.com)

### Universal Radio

[www.universal-radio.com](http://www.universal-radio.com)  
800-431-3939

## MT HAS NO P.O. BOX

If you're a long-time subscriber, you may automatically still use the old PO Box 98 when corresponding with *Monitoring Times* or Grove Enterprises. That box was closed years ago, and the Post Office is getting a little "PO'ed" over having to forward them. Please make a note that our proper mailing address is:

7540 Hwy 64 West  
Brassstown, NC 28902

*Thank you: We love to hear from you!*



## Monitoring the Aero Bands via the Net

**R**ecently, while watching one of the cable news channels, they interrupted their regular programming with a breaking news alert. An American Airlines flight inbound to Miami International Airport had mechanical issues and they weren't getting a "gear down" indication in the cockpit.

Since I am a radio hobbyist, I do not like to be left out of the action. That is why I have a shack full of scanners. Unfortunately, because the civilian aircraft band is a line of sight VHF (108-137 MHz) allocation, I am not going to be able to hear aero communications from Miami from the speakers in my shack. Or am I?

I immediately went to my favorite search engine Google and found the exact link I needed to cut me in on the drama over the skies in Miami: an Internet scanner audio feed of various air traffic control frequencies from the Miami International Airport.

Listening to the communications let me feel like I was sitting in that cockpit/control tower as the drama unfolded during the in-flight emergency. Fortunately, the plane landed safely and I could move on to other scanner pursuits.

I have to admit that I am an aircraft freak. I love aircraft, watching aircraft, photographing aircraft, and listening to aircraft. Here is a hint why: I spent 23 years in naval aviation. Over the years I have had more than a few chuckles when I hear most scanner buffs say they find aircraft monitoring boring.

Yes, the normal air traffic control (ATC) communications can be a bit monotonous when the skies are blue and the weather is calm. But let bad weather roll in or some emergency situation trouble the skies, and your scanner connection can put you right in the thick of things.

But, like other VHF/UHF services, aeronautical services are still basically line of sight. So, what can you do the next time you hear about an aircraft emergency and you want to get in on the action? Again, the Internet is the answer.

### ❖ My Favorite Aero Website

My favorite Internet aero website is one that covers my area of the country like no other. **ATCMonitor.com** not only streams ATC communications, but also streams ATC radar information for their area of coverage.

Designed to help educate the public about air traffic control, ATCMonitor.com is a unique resource for the curious public, travel enthusiasts, aviation professionals, student and accomplished pilots, flight simulation enthusiasts, student air traffic controllers, aviation retirees, air traffic

controllers, or anyone with an interest in what goes on in en route air traffic control centers (ARTCC), terminal approach controls, and airport control towers.

ATCMonitor.com is first site in the world to ever stream audio *and* radar video of an en route air traffic control frequency online. Due to this site's complexity, only Internet Explorer is supported with the Windows Media Player 10.x+. Audio and radar video is delayed about five minutes in accordance with United States Federal Regulations.

On this website you can monitor three different services – an ARTCC sector, a TRACON (terminal air control, aka approach control), and a control tower.

The ARTCC frequency that is streamed is the busiest en route air traffic control corridor in the world: Northeast Atlanta Arrival. The en route center frequency being streamed is 121.350 MHz.

The controllers who work this sector named it LOGEN, although they may have changed that name recently due to the decommissioning of the Macey arrival. LOGEN is Atlanta's northeast low altitude sector, handling all arrival aircraft from the northeast between 11,000 feet up to 23,000 feet. LOGEN is one of the top five busiest arrival corridors in the world, and it is the busiest arrival corridor for one of the world's top busiest airports, Atlanta Hartsfield Jackson International.

LOGEN is run by controllers from the Atlanta Air Route Traffic Control Center located in Hampton, Georgia.

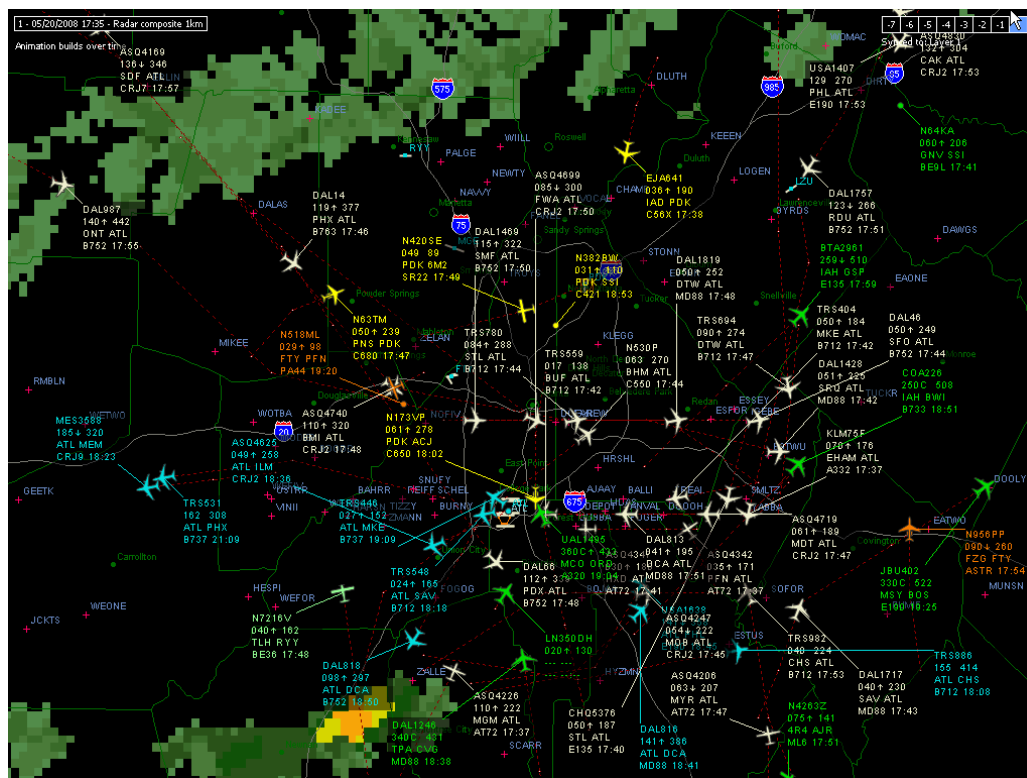
Another feed served by this website is the Atlanta Terminal Approach Control. The Atlanta TRACON frequency being streamed is 127.250 MHz, which is Atlanta's north final arrival sector control.

The final audio feed that you can select is the Atlanta Tower, also servicing the Atlanta Hartsfield Jackson International Airport. The two Atlanta Tower frequencies being streamed are for the north tower – 119.100 and 125.325 MHz.

There are two radar video streams served by this website. The large coverage radar video is usable when you monitor the Atlanta ARTCC frequencies. You can see aircraft as far north as Knoxville, as far west as Hinch Mountain (Crossville, Tennessee) and Chattanooga, south to Atlanta Hartsfield, and to the northeast to Hickory, North Carolina.

The second radar video stream covers the area in and around the Atlanta area. You can see aircraft arriving and departing the Atlanta area.

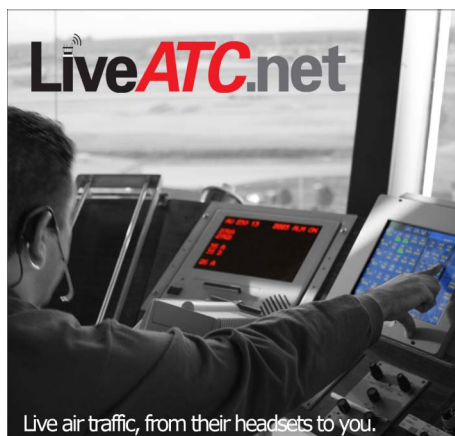
There is an excellent FAQ (Frequently Asked Questions) page on the website that explains what you are seeing on each of the radar video streams, including the various color schemes, information being displayed for each aircraft, and other details that you might ask about the site and the various services being streamed.



If you want to get a feel for what air traffic communications sounds and looks like, this is a "must visit" website.

## ❖ LiveATC.net

The second premier aeronautical audio streaming website on the Internet is the **LiveATC.net**. LiveATC.net is a web site and a community designed to unite pilots, student pilots, flight instructors, airband communication enthusiasts, and real and virtual air traffic controllers. Its target audience is anyone who can learn from or who just enjoys listening to live aviation communications. The community is fueled by volunteers who live within radio range of airports and who use spare radio and computer equipment to relay airband transmissions into the LiveATC.net audio network.



LiveATC.net was founded by Dave Pascoe, a pilot and ham radio operator who has been an avid ATC listener for many years.

A LiveATC.net "feed" is an audio stream provided by a volunteer, usually referred to as a "feeder." Each stream is sent into the LiveATC audio distribution system so that any interested listener can tune it. The audio distribution system consists of a network of streaming audio servers, which effectively make the single stream sent by the "feeder" available to many listeners.

At press time, LiveATC.net has over 200 audio aero feeds. These links are lumped into categories sorted by ICAO airport identifiers. Here is a list of some of the more interesting feeds on this website.

### ATC FACILITIES CLASS B AIRSPACE

KBOS	Boston Logan Airport, MA – Airport and approach services
KBWI	Baltimore-Washington International, MD – Approach and ARTCC services
KCLE	Cleveland-Hopkins International, OH – Airport, company and approach services
KCVG	Cincinnati/Northern Kentucky International, OH – Airport and approach services
KDCA	Ronald Reagan Washington National, DC – Approach Services
KEWR	Newark Liberty International, NJ – Approach and ARTCC services (Stereo feed)
KJFK	John F. Kennedy International, NY – Airport, approach, and ARTCC services (several feeds)
KLAS	McCarren International (Las Vegas), NV – Airport and approach services
KLGA	La Guardia Airport, NY – Tower

KMCO	Orlando International, FL – Airport and approach services
KMIA	Miami International, FL – Clearance Delivery and approach services
KMSP	Minneapolis/St. Paul International, MN – Tower
KORD	Chicago O'Hare International, IL – Various services
KPHL	Philadelphia International, PA – Approach/Departure Services
KSEA	Seattle-Tacoma International, WA – Airport, approach, and ARTCC services
KSFO	San Francisco International, CA – Airport, approach, and ARTCC services
KSCL	Salt Lake City International, UT – Airport and arrivals services

### ATC FACILITIES CLASS C AIRSPACE

Here is a list of the Class C airports that have audio streams of various ATC services from LiveATC.net:

Allentown, PA (KABE); Abilene, TX (KABI); Albany, NY (KALB); Austin, TX (KAUS); Billings, MT (KBLI); Nashville, TN (KBNA); Burlington, VT (KBTU); Buffalo, NY (KBUF); Burbank, CA (KBUR); Columbus, OH (KCMH); Champaign, IL (KCMH); Daytona beach, FL (KDAB); Dayton, OH (KDAY); Greensboro, NC (KGSO); Huntsville, AL (KHSV); Indianapolis, IN (KIND); Islip, NY (KISP); Lubbock, TX (KLBB); Lexington, KY (KLEX); Chicago Midway International, IL (KMDW); Manchester, NH (KMHT); Milwaukee Approach/Departure, WI; Madison, WI (KMSN); Oakland, CA (KOAK); Palm Beach, FL (KPBI); Portland, OR (KPDX); Providence, RI (KPVD); Raleigh/Durham, NC (KRDU); Reno, NV (KRNO); Rochester, NY (KROC); San Antonio, TX (KSAT); Sanford/Orlando, FL (KSFB); San Jose, CA (KSJC); Orange County, CA (KSNA); Syracuse, NY (KSYR); Toledo, OH (KTOL); and San Juan, PR (KSJU/TJSJ).

There is also an extensive list of Class D airports, ARTCC selected sectors (Boston, Chicago, Cleveland, Gander, Houston, Moncton, New York, Toronto, and Washington centers), 10 Canadian aerodromes, and overseas feeds from South Africa, Kuwait, Netherlands, Ireland, Bulgaria, Greece, Romania, Switzerland, Honduras, Panama, Mexico, Australia, Argentina, Brazil, Aruba, and Curacao that are streamed via this website.

So, if you want to monitor aircraft communications, the Internet is a great way to get in on the action, even if you live outside the line of sight range of a major airport.

## ❖ Did You Know?

Did you know that you can watch television across the net? While traveling around doing research for this month's column, I bumped into a really neat portal called the **World Wide Internet Television** (link in our GlobalNet Resource Guide). WwiTV has over 2,300 live and on demand online television broadcast links on its website. In order to watch some of these video broadcasts you will have to have bandwidths from 28.8 Kb/s to 2000 Kb/s. Software used by these internet broadcasts include the Real Audio player, Windows Media Player, Apple's Quicktime, and Winamp.

There is a lot to cover on this internet portal (and a few others as well), so I will leave that for another GlobalNet column.

Until next time, good hunting on the GlobalNet.

### GLOBALNET RESOURCE GUIDE

ATCMonitor.com - <http://atcmonitor.com/>  
 Futura Studios Live ATC and Live Airport Webcams - [www.futurastudios.com/atc.html](http://www.futurastudios.com/atc.html)  
 LiveATC.net - [www.liveatc.net/index.php](http://www.liveatc.net/index.php)  
 LowApproach.com - [www.lowapproach.com/](http://www.lowapproach.com/)  
 Mexico City, Mexico - [www.apm-group.com.mx/atc.html](http://www.apm-group.com.mx/atc.html)  
 NAS Norfolk, VA - [www.hrconnect.com/streaming/](http://www.hrconnect.com/streaming/)  
 Norfolk, VA airport - [www.hrconnect.com/streaming/](http://www.hrconnect.com/streaming/)  
 Phoenix, AZ area feeds - [www.squawkvfr.net/](http://www.squawkvfr.net/)  
 Rochester MN ATC - [www.rst-atc.com/](http://www.rst-atc.com/)  
 San Diego Area ATC - [www.scansandiego.net/cgi-bin/index.pl](http://www.scansandiego.net/cgi-bin/index.pl)  
 Schiphol ATC (Amsterdam) - [www.atcbox.com/](http://www.atcbox.com/)  
 Southern Cal Approach - <http://lowapproach.com/socalapproach.ram>  
 Toronto Center Air Traffic Control Facility - <http://cykf.net/Liveatc/Index.html>  
 University of Oklahoma-Westheimer Field (OUN) - Norman, OK - [www.aviation.ou.edu/tower.m3u](http://www.aviation.ou.edu/tower.m3u)  
 World Wide Internet Television - <http://wwitv.com/portal.htm>

### GLOBALNET AUDIO SOFTWARE RESOURCE GUIDE

Icecast Media Player - [www.icecast.org/](http://www.icecast.org/)  
 Real Audio Player - [www.real.com/](http://www.real.com/)  
 Butel Client Software - [www.netcore.us/ezs/eazystream\\_clientsetup.zip](http://www.netcore.us/ezs/eazystream_clientsetup.zip)  
 Teamspeak - [www.gotamspeak.org/](http://www.gotamspeak.org/)  
 Winamp Media Player - [www.winamp.com/](http://www.winamp.com/)  
 Windows Media Player - [www.microsoft.com/wmp](http://www.microsoft.com/wmp)

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## The Pros and Cons of Older Scanners

**W**hile time and technology march on, many readers would like to continue using their older scanners. This month we answer a couple of questions regarding these “outdated” receivers and what activity readers might be missing. We also report on a rather adventuresome listener in Tennessee and answer a reader query about Long Island.

### ❖ Ontario, Canada

*I have a Realistic PRO-2001 scanner all working well and in good shape. I'm looking for the frequencies for Ontario, Canada for weather, police, cell phones, cordless phones, 911 calls, and so on. The scanner is a 16-channel model. Can you please help me out?*

James in Arnprior

Arnprior is a town of about 7,000 in Ontario Province, located about 60 kilometers west of Ottawa. The town is in eastern Renfrew County, which has a population of about 100,000 spread across an area of more than 2,800 square miles.

Now more than 20 years old, the PRO-2001 scanner was one of the first “frequency synthesized” scanners on the market. Earlier generations of scanners required the use of individual crystals or a setting knob to tune to a particular frequency. If you wanted to scan a new frequency, you had to buy a new crystal or retune the setting knob.

With the development and commercialization of computer electronics in the late 1970s and early 1980s, a new generation of scanners using microcomputer technology hit the market. The PRO-2001 and subsequent scanners used a pre-programmed microprocessor to accept a frequency from a keypad and control a *frequency synthesizer*—a computer-controlled oscillator—and immediately and accurately tune to that frequency. This was a giant leap forward for scanner listeners and the PRO-2001 is a milestone in that arena. Although long since discontinued and replaced by more capable units, we'll see that the PRO-2001 (as well as many old scanners of similar vintage) is still capable of performing useful service.

The PRO-2001 covers three frequency ranges: 30 to 50 MHz, 144 to 174 MHz, and 430 to 512 MHz. In the Arnprior, Ontario region, these bands still contain a good deal of radio traffic.

The PRO-2001 shows the active frequency on an LED (light-emitting diode) display and each of the 16 channels has an individual lockout switch. Because you have only sixteen channels to



Environment  
Canada

Environnement  
Canada

work with, you must be somewhat picky in which frequencies to monitor.

The Meteorological Service of Canada (MSC), part of Environment Canada, provides weather and environmental information, including watches and warnings, 24 hours a day on dedicated radio frequencies. Weatheradio Canada began in 1977 and now has more than 180 transmitter stations across the country. In the Renfrew area, the following stations should be available:

Frequency	Description
162.400	Algonquin Park
162.425	Renfrew
162.475	Pembroke
162.550	Lavant
162.550	Ottawa-Gatineau

Be sure to program the one with the best signal in your area, but plan on using the lockout switch to disable reception for that frequency. Since these are continuously transmitting, you'll need to lock them out when scanning for other activity.

The electric utility Hydro One, owned by the Ontario government, has operations in Renfrew and Arnprior that might be heard on 49.33 MHz.

Municipal activity for Arnprior can be heard on the following frequencies:

Frequency	Description
154.340	Arnprior Fireground
154.725	Arnprior Recreation Department
155.910	Arnprior Public Works

Renfrew County also operates on several frequencies that the PRO-2001 can scan:

Frequency	Description
154.010	County Fire (Mutual Aid)
154.540	County Emergency Medical Services (Dispatch)
155.250	County Fireground
158.535	Saint John Ambulance

A few other frequencies in the Arnprior area which might have interesting activity:

Frequency	Description
153.260	A1 Taxi
160.305	Ottawa Central Railway
161.505	Ottawa Valley Raillink
460.6625	Arnprior District Memorial Hospital
464.5000	Arnprior District Memorial Hospital

### What You're Missing

The Ontario Provincial Police (OPP) operate

a mutual aid service for all police on 142.770 MHz; however, this is just outside the frequency range of the PRO-2001. Other conventional frequencies with law enforcement activity are similarly found on frequencies beyond the tuning range of the scanner.

Unfortunately for James, even further beyond the capabilities of the PRO-2001 is the Ontario Provincial Government trunked radio system. Operating between 140 and 155 MHz, the system carries police and ambulance traffic in both analog and digital formats. A much newer scanner would be required to properly track and monitor this system.

As with most areas of the United States and Canada, there are special interest groups on the Internet dedicated to monitoring the province of Ontario. Two groups on Yahoo! appear to be particularly active. “Scanont” has just over 1,900 registered members and can be accessed at <http://groups.yahoo.com/group/Scanont>. Another group, “Eastern Ontario Scanning” has more than 400 members and can be reached at <http://groups.yahoo.com/group/EasternOntarioScanning>.

### ❖ Ohio

*After reading some of the material on your web site I am still unsure of what radio I would like to buy for my retired father who enjoys listening to fire, police, etc. on his scanner. The one that he has now is outdated, and he only hears partial information. I learned about the trunk tracking radios from a friend of mine who is on the Sheriff's Department. Unfortunately I can't afford the type that he has, but would like to find out what radios would be good choices for my father. He lives in Holland, Ohio, and really enjoys listening to what's going on with fire, police, rescue, etc.*

Terri in Toledo

Holland, Ohio is a town of about 1,300 residents located in Lucas County, just west of Toledo. Lucas County itself is home to just under half a million people and has three major interstates (I-75, I-80 and I-90) passing through its boundaries.

It is understandable why an older scanner would be missing some of the action. Public safety agencies in Lucas County, including the city of Toledo, are now operating on a new digital radio system. The new system follows a set of standards called Project 25 that describe a digital format for radio communication. Older scanners that cannot follow Project 25 transmissions are unable to monitor this activity.

One advantage of a new countywide system



is that all of first responders and emergency personnel have a common radio platform, making it relatively easy for them to communicate with each other during a crisis. The new system is also able to work with the Michigan statewide network to the north and will eventually connect with the Ohio MARCS state network, which we discuss below.

The drawback for listeners is that programming and operating the new digital-capable scanners can be rather more complicated than the older models.

The new Lucas County system operates on the following frequencies: 851.0625, 851.4625, 851.4875, 852.0625, 852.1125, 852.2125, 852.4625, 852.4875, 853.0625, 853.1625, 853.4625, 853.4875, 854.0625, 854.4625, 854.4875, 855.0625, 855.1125, 855.4625 and 855.4875 MHz.

Some of the public safety talkgroups on the system include:

Decimal	Hex	Description
10000	2710	County Sheriff (Dispatch)
10008	2718	County Sheriff (Secondary Dispatch)
10016	2720	County Sheriff (Detectives)
10032	2730	County Sheriff (Corrections)
10040	2738	County Sheriff (Records)
10048	2740	County Sheriff (Tactical 1)
10056	2748	County Sheriff (Tactical 2)
10112	2780	Sheriff (Interoperability)
10120	2788	County Fire (Interoperability)
10168	27b8	Toledo Fire (Dispatch)
10176	27c0	Toledo Emergency Medical Services (Dispatch)
10184	27c8	Toledo Fire (Fireground)
10192	27d0	Toledo Fire (Hazardous Materials)
10200	27d8	Toledo Fire (Training)
10208	27e0	Toledo Fire (Special Events)
10216	27e8	Toledo Fire (Tactical)
10432	28c0	Toledo Police (Patrol - North)
10440	28c8	Toledo Police (Patrol - Central)
10448	28d0	Toledo Police (Patrol - South)
10456	28d8	University of Toledo Police (Dispatch)
11984	2ed0	Toledo Police (Investigations)
11992	2ed8	Toledo Police (Records 1)
12000	2ee0	Toledo Police (Records 2)
12008	2ee8	Toledo Police (Directed Patrols)
12016	2ef0	Toledo Police (Special Events)
12208	2fb0	Emergency All-Call Fire
12216	2fb8	Toledo Police Emergency All-Call
12632	3158	Toledo Police (Tactical 1)
12640	3160	Toledo Police (Tactical 2)
13336	3418	University of Toledo Health Sciences Campus
13344	3420	University of Toledo Police
13352	3428	University of Toledo Police
13360	3430	University of Toledo Police
13368	3438	University of Toledo Police
13376	3440	University of Toledo Police
13432	3478	Fire Station Alerting

The State of Ohio operates the Multi-Agency Radio Communications System (MARCS), which carries voice traffic in digital Project 25 format but uses an older method of signaling for talkgroup coordination. MARCS includes a number of State organizations, including the State Police, Emergency Management Agency, National Guard, and Departments of Health, Natural Resources and Transportation.

In the Toledo area, MARCS uses the following frequencies: 866.5875, 866.8375, 866.8875, 867.3125, 868.2625 and 868.5125 MHz. In

addition to State activity, a handful of local fire departments and the county Sheriff have assigned talkgroups on the system.

Decimal	Hex	Description
21200	52D	Oregon Fireground
21216	52E	Whitehouse Fireground
21264	531	Springfield Township Fireground
31920	7CB	County Sheriff's Office (Tactical)

In order to hear all of the public safety agency activity in Lucas County, a fully digital scanner is a necessity. There are several models that have the ability to both track and monitor Project 25 systems:

Model	Manufacturer	Type
BC296D	Uniden	Portable
BCD396T	Uniden	Handheld
BC796D	Uniden	Base/mobile
BCD996T	Uniden	Base/mobile
PRO-96	GRE/Radio Shack	Handheld
PRO-2096	GRE/Radio Shack	Base/mobile
PSR-500	GRE	Handheld
PSR-600	GRE	Base/mobile

If your retired father spends most of his time around the house, a base model might be most appropriate, since it can be operated easily and is less likely to be dropped or misplaced. On the other hand, if your father is out and about, a handheld as a constant companion might see more use.

I understand that there are budgetary constraints, so a used but well-cared-for scanner would certainly be appropriate. Grove Enterprises and other advertisers in this magazine sell such units. If you'd rather have a new radio from the factory, Radio Shack often runs sales on the PRO-96 and PRO-2096. If you're fortunate, you may find a local Radio Shack with a scanner enthusiast on staff who can help you set it up for local monitoring.

## ❖ More than Public Safety

*In your January Scanning Report column, you asked to hear from people who monitor things other than public safety. I have spent a good part of my scanning time over the past few years attempting to figure out the various users on two commercial trunked systems in the Chattanooga, Tennessee area. Figuring out who the users are is usually pretty hard. You have to make notes about things and locations that are discussed on the air and try to figure out who is on each talk group. Sometimes the type of business is pretty clear, such as a plumbing company, but which plumbing company can be a challenge to figure out.*

*Basically I have two ways that I have used over the years. First, just clues from what is said. For example, I once heard discussions about setting up for a stage show that was coming to town. From the newspaper I found that the show was coming to Memorial Auditorium, thus the talkgroup was identified. Second, sometimes I hear that someone is driving to a location near me, and I drive there too and wait to see who shows up.*

*I have listed the details of the trunked systems that I monitor below. Some of the talkgroups have been identified by other monitors in the area, and some personally by me. I have marked the ones I identified myself with an asterisk. Most of the activity in the area is on the Communications and*

*Electronics system, with only a small amount on the Tri-County Communications system.*

*Until a few months ago, the Tri-County system was used heavily by BFI (a company engaged in garbage collection), but they appear to have stopped using it now. They often provided more timely traffic information than the local news!*

*Keep up the good work with your column.*

*Jim in Tennessee*

## Communications & Electronics Trunked Radio System

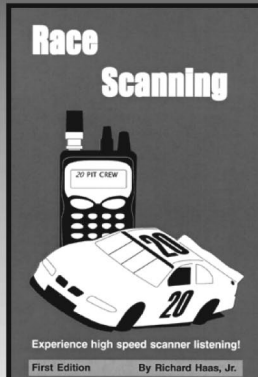
Control channel frequencies: 857.6375, 858.6375, 859.6375, 860.6375

Other Frequencies used: 856.0375, 857.0375, 858.0375, 859.0375, 860.0375, 856.8375

Motorola Type I, Fleet Map E1P8

Talkgroup	Comments
010-1	Tire repair & changing
054-1	Humane Society *
089-1	Memorial Auditorium *
0101-1	Tennessee Waste Haulers *
0105-1	Concrete company
0118-1	Delivery service?
0125-1	21st Century Daycare
300-1	Keefe Plumbing *
302-1	Roofing/construction company
303-1	STS Transportation (for handicapped/elderly) *
307-1	Concrete - probably Vulcan Materials
311-1	Blue Cross/Blue Shield Maintenance*
311-2	Blue Cross/Blue Shield Security *
312-1	Transporting people to/from doctors
313-1	Towing
315-1	unknown user
400-4	Security company?
402-0	Angel EMS channel 1

# Race Scanning



**Chapters:**

- History of race comms.
- What you can hear
- Racing terms
- Racing flags
- Choosing a scanner
- Tips and tricks
- Racing frequencies

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## 402-1 Angel EMS channel 2

Checking these frequencies in the FCC database, it appears this system is Chattanooga SMR, Inc. The FCC database reports the transmitter site is located on Wilcox Boulevard in Chattanooga.

**Tri-County Communications Trunked Radio System**

Control Channel Frequencies: 857.8375, 858.8625, 859.7875

Other frequencies used: 856.8375, 860.8875

Motorola Type I, Fleet Map E1P8

Talkgroup	Comments
000-1	Tri-County radio technicians?
300-1	Hearon Construction & Trucking *
500-3	Landfill?

*\*I have personally verified these, either by deduction from conversations or by driving to locations mentioned.*

## ❖ Nassau County, New York

Can you please do an article with Nassau County Police Department frequencies, including the First and Seventh Precincts? Also can you print medical frequencies – including NUMC, Highway Patrol and Helicopter?

Mike in New York

Nassau County is located on Long Island, New York, and is primarily a suburban area with about 1.3 million residents. Two-thirds of the 435 square miles of the county are land, with the rest covering parts of Long Island Sound and the Atlantic Ocean.

The Nassau County Police Department is one of many large law enforcement organizations to use a "Mobile Plate Hunter," an infrared automobile license plate reader, to automatically identify stolen vehicles and locate owners who might have outstanding tickets or warrants. The Highway Patrol unit of the department patrols the Long Island Expressway and the Seaford-Oyster Bay Expressway. The following table lists a number of conventional radio frequencies used by the Nassau County Police Department.

Frequency	Description
470.8125	Highway Patrol Mutual Aid to NYPD
470.8375	Highway Patrol Mutual Aid to NYPD
470.8625	NYPD (countywide)
477.1875	Administrative
477.2125	County Police Precincts 4 and 5
477.2375	Narcotics
477.2625	Highway and Emergency Service
477.2875	Aviation and Marine Units
477.3875	County Police Precincts 2 and 8
478.5375	County Police Precincts 1 and 7
478.5625	County Police countywide tactical
478.7125	County Police Detectives
478.7375	County Police (Car-to-Car)
478.9125	County Police Precincts 3 and 6
478.9375	Surveillance

You may also want to include 39.46 MHz in your scanner programming, since it is the Statewide Low Band Intersystem channel for law enforcement mutual aid.

NUMC is the Nassau University Medical Center, a 530-bed teaching hospital in East Meadow that serves more than 75,000 emergency room patients and nearly 200,000 people from various facilities and clinics.

Frequency	Description
462.950	Medical channel 9 (Secondary Dispatch)
462.975	Medical channel 10 (Primary Dispatch)
463.000	Medical channel 1
463.025	Medical channel 2
463.050	Medical channel 3
463.075	Medical channel 4
463.100	Medical channel 5
463.125	Medical channel 6
463.150	Medical channel 7
463.175	Medical channel 8

NUMC activity may also be found on the Nassau County trunked radio system, a five-site EDACS (Enhanced Digital Access Communications System) network. The repeater sites are located in East Meadow, Oyster Bay, Rockville Centre, Roslyn, and Thomaston.

The network uses fourteen frequencies, and as with all EDACS frequencies, these must be entered in Logical Channel Number (LCN) order. Your scanner manual will have instructions on how to program the frequency into the proper memory location to correctly track EDACS conversations.

LCN	Frequency
01	866.1875
02	866.3375
03	866.5875
04	866.7375
05	866.8375
06	866.9000
07	867.1125
08	867.1750
09	867.9000
10	868.1750
11	868.4250
12	868.5750
13	868.7250
14	868.6500

Talkgroups on EDACS systems may be identified in one of two formats, either in decimal or in Agency-Fleet-Subfleet (AFS). The following is a list of talkgroups on the Nassau County network that might fit your interest.

Dec	AFS	Description
County Public Works		
305	02-061	(Hazardous Materials)
313	02-071	(Tactical 1)
314	02-072	(Tactical 2)
315	02-073	(Tactical 3)
316	02-074	(Tactical 4)
317	02-075	(Tactical 5)
321	02-081	(Tactical 6)
322	02-082	(Tactical 7)
323	02-083	(Tactical 8)
324	02-084	(Tactical 9)
325	02-085	(Tactical 10)

517	04-005	Sheriff (Tactical 1)
521	04-011	Sheriff (Dispatch)
522	04-012	County Jail Security South
523	04-013	County Jail Security North
524	04-014	Sheriff Prisoner Transport
525	04-015	County Jail Administration

526	04-016	County Jail Maintenance
527	04-017	Sheriff Supervisors
532	04-024	Sheriff (Tactical 4)
533	04-025	Sheriff (Tactical 5)
534	04-026	Sheriff (Planning)
540	04-034	Sheriff (Tactical 1)
541	04-035	Sheriff (Tactical 2)
542	04-036	County Mutual Aid
544	04-040	County Mutual Aid
545	04-041	Special Weapons and Tactics (SWAT)
825	06-071	County Emergency Management
826	06-072	County Emergency Management (Tactical 1)
833	06-081	County Fire Supervision
834	06-082	County Fire Investigation (Tac1)
835	06-083	County Fire Investigation (Tac2)
836	06-084	County Fire Hazmat Tactical 1)
837	06-085	County Fire Hazmat Tactical 2)
838	06-086	County Fire Marshal
839	06-087	County Fire Marshal
841	06-091	County Fire Marshal
842	06-092	County Fire Marshal
843	06-093	County Fire (Tactical 1)
844	06-094	County Fire (Tactical 2)
845	06-095	County Fire (Tactical 3)
846	06-096	County Fire (Tactical 4)
847	06-097	County Fire 1
849	06-101	County Fire Hazmat
850	06-102	County Fire 2
851	06-103	County Fireground

County Medical Center		
897	07-001	(Security)
898	07-002	(Fire/Safety)
899	07-003	(Investigation)
900	07-004	(Administrative)
903	07-007	(Tactical 1)
915	07-023	Ambulance (Main)
916	07-024	Ambulance (Secondary)
917	07-025	Patient Transportation
918	07-026	Patient Transportation (Supervisor)
919	07-027	Patient Transportation (Tac1)
921	07-031	Patient Transportation (Tac2)
929	07-041	County Medical Examiner
930	07-042	County Medical Examiner (Tac1)
931	07-043	County Medical Examiner (Tac2)
932	07-044	County Medical Examiner (Tac3)
1232	09-100	County Emergency Management (All Call)
1281	10-001	Metropolitan Suburban Bus Authority (MSBA) Night Operations
1282	10-002	Long Island Railroad (LIRR)
1283	10-003	MSBA (Evacuation)
1284	10-004	MSBA Maintenance
1285	10-005	MSBA Trains
1286	10-006	MSBA
1287	10-007	MSBA Beach
1288	10-010	MSBA Police
1289	10-011	MSBA Buses
1290	10-012	MSBA Administration
1291	10-013	MSBA Buses
1292	10-014	MSBA (Special)
1293	10-015	MSBA Security
1294	10-016	MSBA Alert
1714	13-062	County Fire Administration

That's all for this month. I'm happy to receive questions, comments, and activity reports to my electronic mail address at [danveeneman@monitoringtimes.com](mailto:danveeneman@monitoringtimes.com). I have more information about scanning and digital radio on my web site at [www.signalharbor.com](http://www.signalharbor.com). Until next month, happy scanning!



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When you buy your Bearcat 796DGV TrunkTracker package deal from Communications Electronics, you get more. The GV means "Great Value." With your BC796DGV scanner purchase, you also get a **free deluxe scanner headphone** designed for home or race track use. Headset features independent volume controls and 3.5 mm gold right angle plug. The 1,000 channel Bearcat 796DGV is packed with features to track Motorola Type I/II/III Hybrid, EDACS, LTR Analog Trunk Systems and Motorola APCO 25 Phase I digital scanner including 9,600 Baud C4FM and CQPSK. Also features control channel only mode to allow you to automatically trunk many systems by simply programming the control channel, S.A.M.E. weather alert, full-frequency display and backlit controls, built-in CTCSS/DCS to assign analog and digital subaudible tone codes to a specific frequency in memory, PC Control and programming with RS232C 9 pin port (cable not supplied), Beep Alert, Record function, VFO control, menu-driven design, total channel control and much more. Our CEI package deal includes telescopic antenna, AC adapter, cigarette lighter cord, DC cord, mobile mounting bracket with screws, owner's manual, trunking frequency guide and one-year limited Uniden factory warranty. For maximum scanning enjoyment, order magnetic mount antenna part number ANTMMBNC for \$29.95. For complete details, download the owners manual from the [www.usascan.com](http://www.usascan.com) web site. For fastest delivery, order on-line at [www.usascan.com](http://www.usascan.com).

### Bearcat® BCT8 Trunk Tracker III

Manufacturer suggested list price \$299.95  
CEI Special Price \$169.95

250 Channels • 5 banks • PC Programmable  
Size: 7.06" Wide x 6.10" Deep x 2.44" High

Frequency Coverage: 25,000-54,000 MHz., 108,000-174,000 MHz., 400,000-512,000 MHz., 806,000-956,000 MHz., 849,0125-868,9950 MHz., 894,0125-956,000 MHz.

The Bearcat BCT8 scanner, licensed by NASCAR, is a superb preprogrammed 800 MHz trunked highway patrol system scanner. Featuring TrunkTracker III, PC Programming, 250 Channels with unique BearTracker warning system to alert you to activity on highway patrol link frequencies. Preprogrammed service searches makes finding interesting active frequencies even easier and include preprogrammed police, fire and emergency medical, news agency, weather, CB band, air band, railroad, marine band and department of transportation service searches. The BCT8 also has preprogrammed highway patrol alert frequencies by state to help you quickly find frequencies likely to be active when you are driving. The BCT8 includes AC adapter, DC power cable, cigarette lighter adapter plug, telescopic antenna, window mount antenna, owner's manual, one year limited Uniden warranty, frequency guide and free mobile mounting bracket. For maximum scanning enjoyment, also order the following optional accessories: External speaker ESP20 with mounting bracket & 10 feet of cable with plug attached \$19.95. Magnetic Mount mobile antenna ANTMMBNC for \$29.95.



### Bearcat® BCD396T Trunk Tracker IV

Suggested list price \$799.95/CEI price \$519.95

APCO 25 9,600 baud compact digital ready handheld TrunkTracker IV scanner featuring Fire Tone Out Paging, Close Call and Dynamically Allocated Channel Memory (up to 6,000 channels), SAME Weather Alert, CTCSS/DCS, Alpha Tagging. Size: 2.40" Wide x 1.22" Deep x 5.35" High

#### Frequency Coverage:

25,000-512,000 MHz., 764,000-775,9875 MHz., 794,000-823,9875 MHz., 849,0125-868,9765 MHz., 894,0125-956,000 MHz., 1,240,000 MHz.-1,300,000 MHz.

The handheld BCD396T scanner was designed for National Security/Emergency Preparedness (NS/EP) and homeland security use with new features such as **Fire Tone Out Decoder**. This feature lets you set the BCD396T to alert if your selected two-tone sequential paging tones are received. Ideal for on-call firefighters, emergency response staff and for activating individual scanners used for incident management and population attack warning.

**Close Call Radio Frequency Capture** - Bearcat exclusive technology locks onto nearby radio transmissions, even if you haven't programmed anything into your scanner. Useful for intelligence agencies for use at events where you don't have advance notice or knowledge of the radio communications systems and assets you need to intercept. The BCD396T scanner is designed to track Motorola Type I, Type II, Hybrid, SMARTNET, PRIVACY PLUS, LTR and EDACS analog trunking systems on any band. Now, follow UHF High Band, UHF 800/900 MHz trunked public safety and public service systems just as if conventional two-way communications were used. **Dynamically Allocated Channel Memory** - The BCD396T scanner's memory is organized so that it more closely matches how radio systems actually work. Organize channels any way you want, using Uniden's exclusive dynamic memory management system. 3,000 channels are typical but **over 6,000 channels are possible** depending on the scanner features used. You can also easily determine how much memory you have used and how much memory you have left. **Preprogrammed Systems** - The BCD396T is preprogrammed with over 400 channels covering police, fire and ambulance operations in the 25 most populated counties in the United States, plus the most popular digital systems. **3 AA NiMH or Alkaline battery operation and Charger** - 3 AA battery operation - The BCD396T includes 3 premium 2,300 mAh Nickel Metal Hydride AA batteries to give you the most economical power option available. You may also operate the BCD396D using 3 AA alkaline batteries. **Unique Data Skip** - Allows your scanner to skip unwanted data transmissions and reduces unwanted birdies. **Memory Backup** - If the battery completely discharges or if power is disconnected, the frequencies programmed in the BCD396T scanner are retained in memory. **Manual Channel Access** - Go directly to any channel. **LCD Back Light** - A blue LCD light remains on when the back light key is pressed. **Autolight** - Automatically turns the blue LCD backlight on when your scanner stops on a transmission. **Battery Save** - In manual mode, the BCD396T automatically reduces its power requirements to extend the battery's charge. **Attenuator** - Reduces the signal strength to help prevent signal overload. The BCD396T also works as a conventional scanner to continuously monitor many radio conversations even though the message is switching frequencies. The BCD396T comes with AC adapter, 3 AA nickel metal hydride batteries, belt clip, flexible rubber antenna, wrist strap, SMA/BNC adapter, RS232C cable, Trunk Tracker frequency guide, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO or ESAS systems. Order on-line at [www.usascan.com](http://www.usascan.com) or call 1-800-USA-SCAN.



### Bearcat® BC246T Trunk Tracker III

Suggested list price \$399.95/CEI price \$214.95

Compact professional handheld TrunkTracker III scanner featuring Close Call and Dynamically Allocated Channel Memory (up to 2,500 channels), SAME Weather Alert, CTCSS/DCS, Alpha Tagging. Size: 2.72" Wide x 1.26" Deep x 4.6" High

#### Frequency Coverage:

25,000-54,000 MHz., 108,000-174,000 MHz., 216,000-224,9800 MHz., 400,000-512,000 MHz., 806,000-823,9875 MHz., 849,0125-868,9875 MHz., 894,0125-956,000 MHz., 1,240,000 MHz.-1,300,000 MHz.

The handheld BC246T TrunkTracker scanner has so many features, we recommend you visit our web site at [www.usascan.com](http://www.usascan.com) and download the free owner's manual. Popular features include **Close Call Radio Frequency Capture** - Bearcat exclusive technology locks onto nearby radio transmissions, even if you haven't programmed anything into your scanner. **Dynamically Allocated Channel Memory** - Organize channels any way you want, using Uniden's exclusive dynamic memory management system. 1,600 channels are typical but **over 2,500 channels are possible** depending on the scanner features used. You can also easily determine how much memory is used. **Preprogrammed Service Search (10)** - Makes it easy to find interesting frequencies used by public safety, news media TV broadcast audio, Amateur (ham) radio, CB radio, Family Radio Service, special low power, railroad, aircraft, marine, racing and weather frequencies. **Quick Keys** - allow you to select systems and groups by pressing a single key. **Text Tagging** - Name each system, group, channel, talk group



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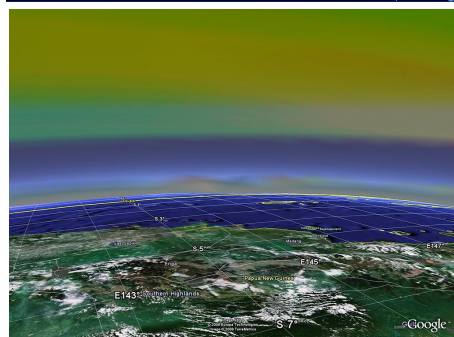
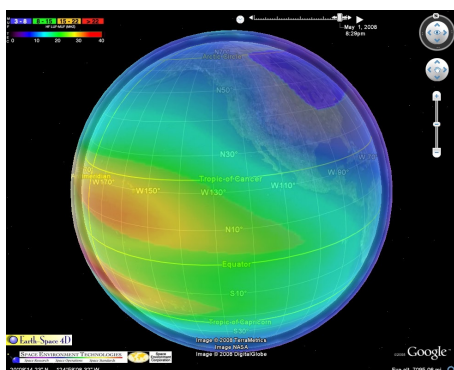


# CAPS: Fly Through the Ionosphere with Me

The uses for Google Earth in the radio hobby just keep on coming. Latest is CAPS, short for Communication Alert and Prediction System. This allows the real-time ionosphere to be projected onto the Google Earth globe and then flown through in three dimensions. Actually, the model is four-dimensional, since it also uses Google Earth animations to show changes over time.

CAPS was funded by the NASA "Living With a Star" program, and a good introduction is online at [www.nasa.gov/topics/solarsystem/features/4dions\\_feature.html](http://www.nasa.gov/topics/solarsystem/features/4dions_feature.html). Real-time satellite observations of solar activity are used to compute electron densities and other useful measurements. These are stored in Keyhole Markup Language (KML) files suitable for loading into Google Earth (among other applications).

The result is the same 3D globe with the surface visible, but now with a color-coded ionosphere up above. "Tilting down" can reveal the layers. Running the animation files can show their daily changes as the planet rotates, and stars pass by behind. The colors by themselves are spectacular enough, but the information available is pretty amazing.



The KML files are obtained at [terra1.spacenvironment.net/~ionops/ES4Dintro.html](http://terra1.spacenvironment.net/~ionops/ES4Dintro.html). Six data sets are available. These are Radio

Availability (usable spectrum), Total Electron Content (TEC), Maximum Useable Frequency (MUF), foF2 (vertically-sounded F2-region maximum frequency), and the past 24 hours' movies of TEC and MUF.

It was especially interesting to me to watch MUF move around the world as the day went on. I've looked at an awful lot of propagation maps, but it was still amazing to actually see it all as an ever-changing, dynamic process.

We've sure come a long way from lists of regions with expected signal levels at given times of day, and trying to remember which region a given transmitter was in. Now, we can see the transmitter, or at least its surrounding countryside, and with a virtual ionosphere above. This is just too cool.

## ❖ Cuban Thunder in the Morning

Or at least, in the morning on the US West Coast. Given the skip conditions that exist on 16-17 megahertz in North America at this time of day, one would almost think the Cuban "numbers" people have given us a schedule all our own.

The new daily schedule now begins at 1500 Coordinated Universal Time (UTC), with the voice broadcast called V02a by the nice folks at the European Numbers Information Gathering and Monitoring Association (ENIGMA 2000). This is on 17515.0 kilohertz (kHz) amplitude modulation (AM), with a parallel transmission for closer-in reception on 5771.0 kHz.

The real fun begins at 1600 UTC. There is an AM voice V02a daily on 17515.0 kHz. At the same time, there's one of those new weird digital things (known as SK01), on either 17435 kHz AM or 17436 kHz upper sideband (USB), depending on how you get the best reception. This one comes blasting in just like Radio Havana. Is it the same transmitter?

This SK01 schedule transfers small, encrypted files in a little-known amateur radio mode called RDFT, for Redundant Digital File Transfer. They are using a finicky little ham shareware called DIGTRX, presumably for Digital Transfer, which was intended more for amateur digital image transmission. Files often have a .txt extension for text, though the contents are still binary data. This station moves its flame-thrower carrier to 16178.0 kHz AM right at 1630, for more of the same.

Finally, V02a is back at 1700, for the full AM voice broadcast usually lasting 40-45 minutes, again on 17435. This transmitter is much

weaker than the one used for SK01. Apparently the Cubans have solved the problem of RDFT performing badly on weak signals by getting rid of the weak signal. Well, it's their electricity.

As always, your guess is as good as mine as to what this all means.

## ❖ Is Cycle 24 a Dud?

There is no doubt that the last solar cycle, number 23, is on the way out of here. If you're like me, you're getting very impatient for the next cycle to bring the higher bands back to life.

Unfortunately, Cycle 24 is late. A few faint spots have come and gone, but it's still among the latest on record. It's so late, in fact, that some scientists are now saying it might indeed be a dud.

One major proponent of the dud theory is Thomas F. Giella, KN4LF. He's been studying various solar phenomena for his entire professional life, and what he has to say will certainly not make you want to blow your life savings on ten-meter antennas. He does not expect it to peak anywhere near the levels that were widely agreed on just a few months ago.

Actually, predictions from this theory have gone way beyond just some unhappy hams. The phrase "little ice age" is starting to come up. This is a theoretical period of global cooling brought on by reduced solar activity, on a much longer cycle than the familiar, 11-year one.

Proponents of a long cycle cite several long-term ups and downs in the accumulated record of solar peaks. The most active period peaked in 1958. The least active started around 1600, when each cycle became weaker and longer than the last. They finally stopped altogether. Between roughly 1645 and 1715, there were few observed sunspots at all. It's known as the Maunder Minimum, and it roughly coincides with a known period of very cold climate – the "little ice age."

All this means that Cycle 24 is getting more attention than it normally would. No one's expecting another Maunder Minimum, but there's been talk of something on the scale of the Dalton Minimum, a lesser solar dip and cold spell between 1790 and 1820. Climatologists are watching all this, in case it partially counteracts "global warming," buying us some badly needed time to reduce pollution.

So there it is. Some people say Cycle 24 will be a winner, and now others expect a loser. Time will tell. Make an offering to the propagation gods, and we'll see you next month.

### ABBREVIATIONS USED IN THIS COLUMN

AFB.....	Air Force Base
AFRTS .....	US Armed Forces Radio/TV Service
ALE .....	Automatic Link Establishment
AM .....	Amplitude Modulation
AWACS .....	Airborne Warning And Control System
CAMSLANT .....	Communication Area Master Station, Atlantic
CAMSPAC .....	Communication Area Master Station, Pacific
CW .....	On-off keyed "Continuous Wave" Morse telegraphy
DEA .....	US Drug Enforcement Administration
E07 .....	Russian Intelligence, bizarre machine voice in English
E10 .....	Israeli phonetic alphabet "female" English voice
E11 .....	"Strich" (/) family, English, "oblique" in callup
EAM.....	Emergency Action Message
FAX.....	Radiofacsimile
G11 .....	"Strich" (/) family, reappeared 2007 after years
HFDL .....	High-Frequency Data Link
HF-GCS .....	High-Frequency Global Communication System
M08a.....	Cuban 3-msg CW/MCW, ANDUWRIGMT = 1-0
MARS .....	Military Affiliate Radio System
MCW .....	Modulated CW, alone or as audio tones
MX .....	Generic for Russian single-letter markers/beacons
NASA.....	US National Aeronautics and Space Administration
PSK .....	Phase-Shift Keying
PSK220F .....	220-baud PSK data transfer mode
RDFT.....	Redundant Digital File Transfer, 8-tone PSK
RTTY .....	Radio Teletype
RY .....	RTTY test sequence (RYRYRYRY...)
Selcal.....	Selective Calling
S11a.....	"Strich" (/) family, Russian, "cherta" in callup
SK01.....	Generic for Cuban numbers in ham digital modes
TACAMO.....	Take Charge And Move Out, aerial command post
UK .....	United Kingdom
US .....	United States
USAF .....	US Air Force
USCG .....	United States Coast Guard
V02a.....	Cuban "Atencion" Spanish numbers, 3-msg format
Volmet .....	"Flying Weather," formatted airport observations
XSL .....	Odd sounding Japanese tone idler for military PSK

All transmissions are USB (upper sideband) unless otherwise indicated. All frequencies are in kHz (kilohertz) and all times are UTC (Coordinated Universal Time). "Numbers" stations have their ENIGMA (European Numbers Information Gathering and Monitoring Association) designators in ( ).

- 2182.0 Saint John's Coast Guard Radio-Canadian Coast Guard, announcing a weather broadcast to follow on 2598 at 0837. (Tom Sevart-KS)
- 2628.0 IQA-Augusta Radio, Italy, marine warnings in Italian, at 2038. (Patrice Privat-France)
- 2789.0 FUE-French Navy, Brest, RTTY test loop with RY's, at 0445. (Sevart-KS)
- 2899.0 Gander-North Atlantic oceanic air control, Canada, getting position of American 78, at 0701. (Allan Stern-FL)
- 3270.0 ULX-Israeli Intelligence (E10), messages at 0404. (Sevart-KS)
- 3327.0 "P"-Russian Navy, Kaliningrad, CW single-letter marker (MX) with messages from RMP, at 2030. (Ary Boender-Netherlands)
- 3450.0 OK-Unlicensed CW beacon, possibly Oklahoma, identifying at 1140. (Sevart-KS)
- 3455.0 New York-North Atlantic oceanic air control, NY, sending unknown flight to 5598 for Santa Maria, at 0705. (Stern-FL)
- 3658.0 "V"-Russian CW single-letter marker (MX), Khiva, Uzbekistan, at 2032. (Boender-Netherlands)
- 3699.5 "P"-Russian Navy, Kaliningrad, CW single-letter marker (MX) with messages from RMP, at 2030. (Boender-Netherlands)
- 3837.0 "P"-Russian Navy, Kaliningrad, CW single-letter marker (MX) with messages from RMP, at 2030. (Boender-Netherlands)
- 4077.0 MO-CW beacon, possibly Oklahoma, identifying at 2251. (Sevart-KS)

- 4079.7 TMP-CW temperature beacon, CA, repeating "TMP 54" (degrees F), at 0613. (Sevart-KS)
- 4089.3 CW dasher beacon, about 80 dashes per minute, at 0507. (Hugh Stegman-CA)
- 4094.3 PA-CW beacon, Arkansas, identifying at 0444. (Sevart-KS)
- 4096.1 CW dasher beacon, 4.5 second dashes, possibly CA, at 0414. (Sevart-KS)
- 4096.3 CW dasher beacon, one per second, at 0414. (Sevart-KS)
- 4096.6 CW dasher beacon, one every two seconds, possibly also CA, at 0414. (Tom Sevart-KS) [Pirate beacon cluster, all heard at once. I have this same chorus going here at 0534. -Hugh]
- 4102.4 "W"-CW wind beacon, letter and dits corresponding to wind speed, at 0555. (Sevart-KS)
- 4113.8 FL-CW beacon, FL, identifier at 0839. (Sevart-KS)
- 4149.0 WPE Jacksonville-Crowley Maritime, FL, taking formatted report from WBN3014, seagoing tug Patriarch, at 0514. WPE, taking report from WBN3013, seagoing tug Sentry, at 0516. (Stern-FL)
- 4174.0 V02a, AM Spanish callup 54202 56240 13453 and messages, at 0301. (Sevart-KS)
- 4235.0 NMF-USCG, Boston, MA, FAX weather chart at 0434. (Sevart-KS)
- 4316.0 NMN-USCG, VA, live male (not "Iron Mike") reading weather, phone ringing in background, at 0526. (Sevart-KS)
- 4331.0 4XZ-Israeli Navy, Haifa, coded CW message in 5-letter groups at 0416. (Sevart-KS)
- 4476.0 Shadow 69-Unknown US military, working Kilo 11 for position report, at 0545. (Sevart-KS)
- 4477.0 003CAP-US Civil Air Patrol, working AVS in ALE, at 0610. (Sevart-KS)
- 4479.0 V02a, AM Spanish message in progress, bad audio and hum, at 0204. (Sevart-KS)
- 4513.0 AARONM-US Army MARS, passing control of the northwest SHARES (SHARed RESources) net to WGY9498 (US Federal Emergency Management Agency), at 0224. (Sevart-KS)
- 4557.7 "D"-Russian single-letter CW beacon (MX), Sevastopol, Ukraine, also using 5153.7, 7038.7, 8494.7, 10871.7, and 13527.7, at 2048. (Boender-Netherlands)
- 4557.9 "S"-Russian single-letter CW beacon (MX), Severomorsk, also using 5153.9, 7038.9, 8494.9, and 10871.9, at 2048. (Boender-Netherlands)
- 4558.0 "C"-Russian single-letter CW beacon (MX), Moscow, also using 5154.0, 7039.0, 8495.0, and 10872.0, at 2048. (Boender-Netherlands)
- 4724.0 Andrews-USAF HF-GCS control station, with an EAM simulcast on 11175, at 1943. (Mdmonitor-MD)
- 5446.5 American Forces Network-US Navy rebroadcast of AFRTS Interruptible Voice Channel, from Saddlebunch Key, FL, sports at 0634. (Sevart-KS)
- 5517.0 Tripoli-European oceanic air control, Libya, selcal DH-AB for Air France 997, a Boeing 777 registration F-GSQH, at 0450. EK771-Mogadishu Radio, selcal GL-BR for Emirates 771, Boeing 777 registration A6-EMK, at 2112. (Privat-France)
- 5547.0 San Francisco-East Pacific oceanic air control, CA, taking position from American 102, at 0719. (Sevart-KS)
- 5565.0 Dakar-Oceanic air control, Senegal, position from Speedbird 234 (British Airways), at 0642. (Sevart-KS)
- 5598.0 Gold 62-USAF KC-135 tanker, selcalled by Shanwick at 0710 N131AG- Dassault Falcon 2000EX bizjet, position for unknown ground station at 0717. (Privat-France)
- 5616.0 TSC322-Air Transat A310, registration C-GFAT, answered selcal KQ-DL from unknown ground station, at 0645. (Privat-France)
- 5649.0 XA-ERH, Mexican Gulfstream III bizjet, selcalled FK-GM by unknown ground station, at 0626. (Privat-France)
- 6250.0 "The Slot Machine" (XSL)-Japanese military, continuous idler tones between encrypted data bursts, sounds like a broken gambling machine, at 0803. (Sevart-KS)



- 6350.0 American Forces Network-US Navy AFRTS relay, Pearl Harbor, HI, at 0645. (Sevart-KS)
- 6450.0 PWZ33-Brazilian Navy, Rio De Janeiro, quick RTTY no-traffic message to unheard station, then test loop with quick brown fox and RY, at 0547. (Sevart-KS)
- 6503.0 NMG, USCG, New Orleans, LA, sending FAX weather charts on the wrong frequency, stepping all over poor Honolulu's scheduled voice weather on 6501, at 0610. (Sevart-KS)
- 6532.0 F-WWDD-Airbus A380 on test flight AP2222, hexadecimal address 5A081C, with HFDL log-on and position for Shannon at 1317. SU0809-Aeroflot 809, HFDL position for Shannon at 2004 (Privat-France)
- 6543.0 Toulouse Technique-French ground station working "3483," unknown Airbus test flight, at 0815. (Privat-France)
- 6586.0 New York-North Atlantic air control, getting position of Jet Blue 727, then sending flight to another frequency for San Juan, Puerto Rico, at 0714. (Stern-FL)
- 6637.0 New York-NY Long Distance Operational Control, patch to company for Florida West 722, at 0145. (Stern-FL)
- 6679.0 Auckland Volmet, New Zealand, with aviation weather at 0653. Honolulu-US Federal Aviation Agency, Volmet aviation weather at 0736. (Sevart-KS)
- 6697.0 Black Flag-Unknown US military, EAMs at 0152 and 0250. (Sevart-KS)
- 6812.0 DZCR-Tactical call of unknown CW station sending numbered messages in code, at 0635. (Privat-France)
- 6932.0 M08a, MCW cut numbers in 5-figure groups, at 2130. (Sevart-KS)
- 6940.0 "Strich" station (G11), German callup "508 strich 00," at 0730. (Mike-West Sussex, UK)
- 7377.0 "Cherta" station (S11a), Russian callup "214 cherta 00," at 0900. (Mike-UK)
- 7527.0 PAC-USCG CAMSPAC Point Reyes, CA, ALE to helicopter J10 at 0140. (Mdmmonitor-MD)
- 7798.0 "Oblique" station (E11), callup "221 oblique 00," at 0915. (Mike-UK)
- 7811.0 American Forces Network-US Navy AFRTS relay, FL, financial program at 0746. (Sevart-KS)
- 7887.0 V02a, AM Spanish message in progress at 2026. (Sevart-KS)
- 8097.0 M08a, MCW cut number callup 71680 06721 68488, at 1800. (Sevart-KS) V02a, Spanish AM callup and message, at 2000. (Mark Morgan-OH) [Supposed to go to 7887 for this one; another Cuban oops? -Hugh]
- 8123.0 Russian "English Man" (E07), callup 171-1, preamble 436/69, and message, at 1740. (Mike-UK)
- 8180.0 SK01, brief AM jazz music, then RDFT transfer of file 71299621.txt, at 0759. (Sevart-KS)
- 8734.0 Olympia Radio-Greek public coastal station, voice loop markers in English and Greek, at 2325. (Sevart-KS)
- 8828.0 Auckland Volmet, New Zealand, aviation weather at 0622. (Privat-France)
- 8829.0 THY Ops-Turkish Airlines, Istanbul, selcalling several aircraft with company traffic at 2039. (Privat-France)
- 8903.0 Zimbabwe 232-Air Zimbabwe Boeing 767 registration Z-WPE, position for unknown ground station at 1910. (Privat-France)
- 8906.0 New York-North Atlantic oceanic air control, working USAF Air Mobility Command Reach 153, at 2145. (Mdmmonitor-MD)
- 8912.0 J33-USCG helicopter Juliet 33, ALE sounding at 1234. 720-USCG HC-130H Coast Guard 1720, ALE sounding, also on 11494, at 1249. (Mdmmonitor-MD)
- 8918.0 New York-North Atlantic oceanic air control, NY, working Delta 57 at 2013. (Sevart-KS)
- 8971.0 Fiddle-US Navy, FL, calling Fighting Tiger 21, a P-3C, at 1835. Golden Hawk-USN, ME, working Tiger 21, a P-3C, at 1940. (Mdmmonitor-MD)
- 8983.0 CAMSLANT Chesapeake-USCG, VA, working Coast Guard Rescue 2114, a Falcon Jet on a search, at 1846. (Stern-FL)
- 9007.0 Trenton Military-Canadian Forces, ONT, patching Shuck 81, an E-3 AWACS that came from 11232, to homeplate at Tinker AFB, OK, at 2053. Trenton, patching Shuck 81 to Raymond 24and Scout Ops, both Tinker AFB, at 2104. (Stern-FL)
- 9040.0 SK01, AM carrier with messages in PSK220F, at 0901. (Sevart-KS)
- 9130.0 EZI2-Israeli intelligence (E10), null-message variant, callup only at 1730. (Mike-UK)
- 9240.0 SK01, AM carrier with messages in PSK220F, at 1000. (Sevart-KS)
- 10242.0 T85-US Customs Beech C-12, ALE sounding, also on 11494, at 1326. HNC-USCG Cutter Harriet Lane (WMEC 903), ALE sounding, also on 8912, at 1338. LNT-USCG CAMSLANT Chesapeake, VA, calling 502 (HC-130H Coast Guard 1502), at 1345. (Mdmmonitor-MD)
- 10315.0 DHN66-North Atlantic Treaty Organization, Geilenkirchen Air Base, Germany, calling unknown station with no joy, at 0615. (Privat-France)
- 10703.0 Russian "English Man" (E07), same as 8123 broadcast, at 1720. (Mike-UK)
- 11175.0 Extremely active period, beginning with unknown weak US military station (possible TACAMO LANT) sending three EAMs at 0040. Foul Line-Possible TACAMO PAC, with several EAMs immediately after the preceding, at 0048. Gun Barrel, instructing Burnside to contact Devil Fox, at 0335. Burnside, patch via Puerto Rico HF-GCS to Devil Fox for orderwire coordination, at 0337. (Jeff Haverlah-TX)
- 11232.0 Trenton Military-Canadian Forces, ONT, patching Georgia Air National Guard Peach 88 to Peachtree Ops (Robins AFB, GA) for refueling coordination, at 1533. (Stern-FL)
- 11253.0 UK Royal Air Force Volmet, aviation weather at 1725. (Stern-FL)
- 11330.0 New York-Oceanic air control, NY, selcal BR-MS and position with USAir 791 (Boeing 757, registration N927UW), at 2149. (Stern-FL)
- 11387.0 Bangkok Volmet, Thailand, female voice with aviation weather, under New York HFDL, at 0010 and 0040. P4-MES-Aruba registry Boeing 767 bizjet owned by Russian billionaire Roman Abramovich, passing HFDL position to ground station 04, Riverhead, NY, at 0312. (Stegman-CA)
- 11494.0 196-US Customs Cessna 550, ALE sounding at 1451. 101-US Customs Cessna 550, ALE sounding at 1543. (Mdmmonitor-MD) OPB-DEA Operations Bahamas and Tortugas (OPBAT), working J12, USCG Juliet 12, ALE at 2013. T16-US Customs, ALE with EST, customs eastern node, at 2035. (Sevart-KS)
- 12123.0 Russian "English Man" (E07), same as 10703, at 1700. (Mike-UK)
- 12359.0 "Herb"-Herb Hilgenberg's old "Southbound II" marine weather net, now in Canada using shore station callsign VAX 498, sending weather information to vessels at 1954. (Sevart-KS)
- 12750.0 NMF-USCG, Boston, MA, FAX weather chart at 1959. (Sevart-KS)
- 13200.0 Andrews-USAF HF-GCS, MD, very long 229-character EAM with the distinctive repetitive exercise formatting and 14-character ending group, at 1311. Andrews, 224-character EAM with repetitive formatting but no ending group, at 1538. (Haverlah-TX) Andrews, shorter EAM at 2119. (Sevart-KS)
- 13907.0 N01-USCG HC-144A, ALE sounding at 1804. J31, USCG helicopter, ALE sounding at 1935. (Mdmmonitor-MD)
- 13925.5 WUK437-Unknown US Army Corps of Engineers, CA, ALE sounding at 1948. (Sevart-KS)
- 13927.0 AFA1QW-USAF MARS, IN, patching Teal 42, a USAF Reserve 53RD Weather Recon WC-130J, to a commercial number regarding dropsonde ops, at 1555. AFA6PF-USAF MARS, CA, patching C-130 Shark 21 (a USAF Coronet Oak mission over Central America) to Keesler AFB Command Post, MS, at 1755. (Stern-FL)
- 15867.0 T97-US Customs Pilatus PC-12/45, ALE sounding at 1726. (Mdmmonitor-MD)
- 16178.0 SK01, AM carrier and RDFT file transfers, came from 17435, at 1630. (Stegman-CA)
- 17435.0 SK01, AM carrier and RDFT transfers, bad hum, at 1600. (Stegman-CA) V02a, AM Spanish callup 84455 77310 85410 and messages, at 1700. (Sevart-KS)
- 17515.0 V02a, AM Spanish messages, weak at 1600. (Sevart-KS)

## Brazilian Navy Digital System

This month we look at some recent activity from South America and take a peek at some interesting digital stations between 16,000 and 16,400 kHz.

### ❖ Bolivian Anti-Drug Units

Bolivia's narco-police recently appeared on HF using standard PacTOR modems. Many decoding programs including Hoka, Wavecom, Skysweeper, RadioRaft and others, are capable of decoding this traffic which is sent in the clear and in Spanish. Messages are typically long lists of confiscated items from cars, boats and planes intercepted by the organization.

The giveaway was the use of the selcall "FELCN," the acronym belonging to La Fuerza Especial de Lucha Contra el Narcotráfico in Santa Cruz. Check the frequency of 6774.8 kHz for activity.

### ❖ More Brazilian Navy Activity

Tipped off by a posting on the UDXF list (<http://groups.yahoo.com/group/udxf/>), I started investigating a Brazilian Navy network using at least one identifier. The ID had been briefly heard a few years ago on the frequencies of 7634.2, 8403, 11109 and 13504 kHz, but no detailed investigation was ever completed.

Initial reports indicated PacTOR traffic, but to-date only GTOR and SITOR-B have been heard. GTOR is now extremely rare on HF, where PacTOR has pretty much superseded it within amateur radio and other circles, so this finding was a little surprising to begin with. Single-tone PacTOR and AX.25 Packet Radio is also sometimes used on this network.

With the radio left on the new frequency of 9255.2 kHz for about a week collecting traffic, the work of unraveling the network began. Google's ability to specify a single website to search, using the "site:" qualifier came in really handy. We were able to test all of the Brazilian Navy sites for clues to the identifiers, which are all 6-letter combinations. Thankfully, a few were found, and then the rest fell into place with a bit more work examining various websites and PDF files.

As you can see from the list below, the network features most of the bases and flotilla that are under the command of the 9th Naval District in the Amazon River region of Brazil. Here's the list of stations heard so far:

CFINGA Captain of the Rio Tabatinga  
ESNVNG Naval Station of the Rio Negro, Manaus  
CPLUIZ Captain of the port of Maranhão, Sao Luiz  
CPNAUS Captain of the port of Manaus  
FLTAMZ Flotilla Amazonas (Broadcast Address)  
RGILEM R24 Supply Boat "Alte Guilhem"  
NPAIBA U17 Helicopter Patrol Boat "Pamaiba"  
NPABOC P62 River Patrol Boat "Bocaina"  
NPFRRM P20 River Patrol Boat "Roraima"  
NPFRTV P21 River Patrol Boat "Raposo Tavares"  
NASHOC U18 Hospital Ship "Oswaldo Cruz"  
NASHCC U19 Hospital Ship "Carlos Chagas"  
NPFRRM P31 River Patrol Boat "Rondonia"  
NPFAMP P32 River Patrol Boat "Amapa"



Patrol Boat Raposo Tavares

These vessels serve a variety of purposes up and down the massive rivers of the Amazon region. Most interesting perhaps are the hospital ships that provide health services to the impoverished population throughout the area.

A variety of traffic can be seen on the network, most of it directed to or from the HQ station in Manaus, which uses the identifier ESNVNG (Estação Naval do Rio Negro). Here's an example of some encrypted traffic directed from Manaus HQ to various ships on the rivers:

DE DE DE WB WB WB  
INT INT ZEV ZEV  
KKKKKKKKKKKKKKKKKKKK  
DE DE WB WB WB WB WB

NAV  
34  
CFINGA FLTAMZ NASHOC NPFRRM  
NPFRTV  
2138  
E113B6C8C121ADF7A3012751D04E641D-  
628A1043BEFFBD88966EFFFFE-  
12A505B14008  
3E5DA145E8D58A1A63C90F7CA47C-  
13E30F1605FE0C8EBD7B281F437B-  
FE1EDF3DC5DFE  
680D58464F93D642

Note above that Manaus identifies in operator chatter as "WB" (and at other times as "WB44"), which makes it likely that the official callsign of the station is PWB44.

Ships tend to follow this two-letter short code, too, "GI" being used by *Alte Guilhem* for example.

The network also carries another style of encrypted traffic that is encoded with a program called Touros, which has also been seen for a number of years on frequencies carrying SITOR-B traffic. In this example, the message is being sent from the river patrol boat *Raposo Tavares* to a number of other shore stations:

TOUROS FOR WINDOWS 2.0  
NPFRTV060QUADR6BNNPFRTV  
P  
250120Z/ABR/08  
6  
FLTAMZ  
20  
NOVDIS CPNAUS CFINGA  
510  
EFD38F13CAC0E0F78253E7222B5744EE-  
683A3EB

Yet another style of encryption seen on the network is wrapped in NATO-style message format between "INI" and "FIN" as you can see from the example from the ship *Pamaiba* below.

RBA.....TWZBC UNO  
TRANS.....  
REFERENCIAL  
P-272100Z/ABR/08  
DE NPAIBA  
PARA AISCTM AISDPC  
GRNC  
BT  
INI  
027042008205959Y6@@@@@@@@@  
@@@@@@@@@TE00- N205  
(?JRr OS=Kf<1F9m000=emVhnpWuhCLrw  
RGkIPU2FIDIDT5A>n89N1

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## Remember to Call Her Deborah

One of the most popular shortwave programs in the 1970s was *His and Hers*, on Radio Nederland, with a husband-and-wife team, Dody and Jerry Cowan. It's fondly remembered by SWLs of sufficient maturity.

The show went off the air in the early '80s, Jerry moved to Canada, the two divorced in 1990, so the possessive pronouns were obsolete, and it was later reported that Dody had died.

Now, thanks to investigation by Mark Vosmeier, N9IWF, in *DX LISTENING DIGEST*, Dody has been found, and she is very much

alive, having celebrated her 70<sup>th</sup> birthday in April. But she remarried and her name now is Deborah Rey, living in France, and an author of fiction and non-fiction. See her website [www.deborahrey.com](http://www.deborahrey.com) and blog <http://rachelsarai.blogspot.com/> for the rest of her story. She also has joined the happystation yahoo group. And there's an illustrated item on the *Media Network* blog.

Clara Listensprechen says: *His & Hers* as well as *Happy Station* provided ambassadorial-level service to the international community for Holland; no one has been able to match that since they left.

**ANGUILLA** Dismantled KTBN Salt Lake transmitter and equipment was being shipped to a "shortwave broadcaster on a tiny island in the Caribbean," where they already have "several radio stations, AM, FM, and shortwave." I suspect this is part of the Caribbean Beacon rehab plan (Ken W. English, UT, DXLD)

**AUSTRALIA** A spiffy new website for Radio Australia has been launched, easier to navigate than the prior version. Even shortwave air times and frequencies are shown. [www.radioaustralia.net.au](http://www.radioaustralia.net.au) (Richard Cuff, PA, Swprograms) Beware: frequency chart not up to date, lacking e.g. new 11945 as of mid-May (Erik Kæie, Denmark, DXLD)

**BANGLADESH** Bangladesh Betar expanded hours for home service on 4750 to 0000-0405, 0830-1810. External service only on 7250, not 9550, including English at 1230-1300, 1745-1900 (via Alokesh Gupta, India, DXLD)

**BOLIVIA** R. Santa Cruz must be the best bet for Bolivia in North American evenings. Once República and jamming are done at 0000, the frequency happens to be open. I tuned to 6134.8 at 0008 and there was Andean music, applause, interviewing kids on a UT Sunday until off around 0130 (Glenn Hauser, OK) Other nights closing at 0108\* (Brian Alexander, PA, DXLD)

**BRAZIL** Cidade Oldies, a self-styled "free radio" station with 50 watts on 7695, says it broadcasts on weekends and holidays starting at 0300, covering southeastern Brazil, and perhaps further, QSL via [cidadeoldies@live.nl](mailto:cidadeoldies@live.nl)

It is likely that in July, all the frequencies of Rádio Guarujá Paulista will resume self-produced programming, instead of from the Sistema Globo network (Célio Romais, *Panorama*) 3235, 5045, 5980, 9715

**CAMEROON** [non] *Sawtu Linjila* is a new broadcast in Fulfulde to Cameroon by the Lutheran World Federation via Wertachtal, Germany, 1830-1859 on 9655. Address is: B.P. 02, Ngaoundéré, Cameroon (WRTH Update and Mauno Ritola, Wolfgang Büschel) Good signal but modulation faded out (José Miguel Romero, Spain, DXLD) Or Voice of Gospel, related to a station in TANZANIA, q.v.

**CANADA** RCI frequencies don't normally have to be cleared by the CRTC, but in May CBC applied for an amendment to allow limited use of 7310, 7325 and 7345 at CKCX, Sackville (via Doug Smith, Ricky Leong, Dean McIntyre, DXLD) As part of normal procedure, the public had an opportunity to 'intervene' or object by June 9. Sure hope they get approved, since RCI has already been using 7310 and 7325. Perhaps this procedure was necessary since they are out-of-band. Each CBCIS SW frequency originally had its own callsign, no longer used by RCI; I think CKCX was for 15190 (gh)

**CHINA** More to last month's lead story about imported SW transmitters being turned into jammers. According to [www.tdp.info/chn.html](http://www.tdp.info/chn.html) all Continental deliveries, ten 420C transmitters and another twenty 418 series 100 kW transmitters, took place in the first half of the nineties. After 2000 another round of even bigger investments in shortwave transmission facilities started, no less than 35 Thomson TSW2500 transmitters, I think more than delivered to all other customers. And this list may well be incomplete, since it omits the Kashi site (Kai Ludwig, Germany, DXLD)

Before big expansion of jamming networks, the Chinese used some highpowered transmitters modulated with CNR-1 in narrow band FM and sometimes with a low frequency growl added. These were then converted to normal AM (Olle Alm, Sweden, *ibid.*)

Haixia zhi Sheng, Voice of Strait, has three different channels on SW; the news channel in Chinese includes some English, 0550-0600 daily except

*All times UTC; All frequencies kHz; \* before hr = sign on, \* after hr = sign off; // = parallel programming; + = continuing but not monitored; 2 x freq = 2nd harmonic; sesqui = one and a half; A-08=spring/summer season; [non] = Broadcast to or for the listed country, but not necessarily originating there; u.o.s. = unless otherwise stated*

Wednesday; 0500-0530 & 0800-0830 Sunday on new 9505. Frequency changes at 1200: News channel 9505 to 4940; Life & Entertainment Channel in Chinese, 7280 to 5050; Minnan Dialect in Amoy, 6115 to 4900 (S. Aoki via S. Hasegawa, NDXC, DXLD)

Following the Sichuan earthquake in May, the minority service from Chengdu was no longer heard evenings on 7225, but Xichang continued on 6060 (S. Hasegawa, Japan, NDXC-HQ) 6060, Sichuan PBS-2, at 1331-1404, replaced usual music with conversation, some Chinese ballads. A few days later 7225 returned and was // 6060 at 1315-1400 with emotional phone calls (Ron Howard, CA, DXLD)

**COSTA RICA** 5954.134, unidentified ELCOR transmitter, Guápiles; heard occasionally in April and May between 2100 and 2200, signal near local level, usual live Spanish male vocals, Shakira and Madonna. What is the purpose and who's behind it? (Terry Krueger, FL, DXLD) Had been only on weekdays but after 2.5 weeks absence, heard once on Saturday, May 10. Always plays Maná. Also heard spurs around 5930, 5975 (Raúl Saavedra, Costa Rica, *ibid.*)

**CROATIA** [and non] HRT HS-1 A-08 in Croatian via Deanovac, non-directional 100 kW: 0457-0756 6165, 0757-1356 9830, 1357-2056 6165; and 10 kW 2057-0456 on 3985v (DX Mix News, Bulgaria) V. of Croatia, 6165 stayed on until 2216\*. 3984.85, varying plus/minus 10 Hz, weak to very weak, heard at 2345-0005+, 0110-0214, including English at 0200, // German relays on 7285, 9925 (Brian Alexander, PA, DXLD)

9925 is the summer frequency, but for a few weeks in April and May, resumed winter frequency 7285 due to poor propagation on 9925, so both were running 2300-0500 altho 7285 was much better here. This might happen again later in summer and fall (gh, OK)

**CUBA** At the end of the RHC Venezuela relay on 17705, April 26 at 2059, heard about 10 seconds of woman reading Spanish numbers, then abruptly cut off. The Cubans messed up and it was kinda cool to catch them doing the numbers thing instantly after the RNV end of program (Kevin Redding, AZ, ABDX)

**ECUADOR** HCJB finally started announcing its own frequencies correctly in Spanish, after years of announcing the wrong frequencies, and months of announcing no frequencies. May 1 at 1259:30 on 11960, the automated ID gave website, and frequencies 11690, 21455 and 11960 in that strange order (gh)

**EGYPT** On April 30 at 0045 to abrupt 0203 sign-off, unID on 6290 AM, recitations from the Kor'an, with pauses in between, "audio clipping," distorting the readability of the signal (Ed Insinger, NJ, DXLD) Surely R. Cairo in Arabic, where it has had its defective transmitter for some time, also noted here May 5 off an hour earlier than scheduled 0300\* This may be why: Egypt went on DST of UT+3 April 25, though it does not affect non-Arabic broadcasts; DST lasts until August 29, per <http://timeanddate.com> (gh)

9250, Radio Wadi el Nil, 2135-2200\*, Arabic talk. Lite instrumental music, Kor'an. Off with anthem (Brian Alexander, PA, DXLD) Nile Valley Radio, another one closing an hour early, and probably starting an hour earlier at 1600 instead of 1700 (gh)

**EQUATORIAL GUINEA** After its single week of activity on 15190, April 11-17, R. Africa was missing until it returned for one day only, May 8, heard at 1958 with American preachers (gh) And as late as 2210, despite WYFR

QRM (Ron Howard, CA, DXLD) Not to be confused with R. Pilipinas, 15190 at 1730-1920 in Tagalog, some English, heard until fadeout 1745 (Björn Fransson, Sweden, *ibid.*)

**ETHIOPIA** [non] V. of Meselna Delina, 1800-1830 on WHRA 17690 is now both Thursday and Friday. Mon 1900-2000 on WHRA 17690 is Demitse-Tewahedo, in Am-

haric (gh) Same as EOTH Holy Synod Radio, Mon 1600-1700 via TDP Samara on 17875 (WRTH Update)

New station via TDP: Addis Dimts Radio in Amharic: Sundays 1600-1700 on 17875 Samara, Russia, 250 kW, 188 degrees to EAF (DX Mix News, Bulgaria)

**HUNGARY** Hungarian Radio which already terminated foreign language SW broadcasts, cut back Hungarian to only five hours a day for Europe: 0100-0200 5965, 0400-0500 3975, 1000-1100 & 1800-1900 on 6025, 2100-2200 on 3975 (WRTH update)

Magyar Rádió is reluctant to explain these cuts, but a public vote in March 2008 forbade the Government to make extra social and medical expenses for the man in the street. Thus it was forced to find other ways to bring down the state deficit and unfortunately this seems to be one of them (Tibor Szilagyi, Sweden, DSWCI DX Window)

I strongly suspect that Magyar Rádió simply could not get rid of the booked airtime until now. Things like running 3975 under broad daylight were no service but merely burning up transmitter hours (Kai Ludwig, Germany, DXLD)

The 0100 broadcast on 5965 is buried under Cuba, but could hear Budapest ID and IS before closing at 0159 (gh, OK)

The only remaining SWBC facility in Hungary is now Jászberény, close to the small village of Jászágó. At present Jászberény is in use about equally by Magyar Rádió and IBB after MR has canceled all the airtime previously used for their closed foreign language broadcasts. It remains to be seen if the now vacant capacity will find new customers, perhaps arranged by Media Broadcast, since Antenna Hungária is owned by TDF as well now (Kai Ludwig, [shortwavesites.yg](http://shortwavesites.yg)) IBB totals 4.5 hours a day; A-08 for IBB via JBR 250 kW with azimuths:

0300-0400 7155 / 065 R Liberty Russian  
1700-1730 9520 / 065 VOA Russian  
1800-1830 9520 / 065 VOA Russian  
1300-1330 11725 / 055 VOA Russian  
1330-1430 11725 / 055 VOA Special English  
1400-1500 15265 / 065 R Liberty Uzbek

(DX Mix News, Bulgaria)

**INDIA** Just as I tuned in 6165, April 24 at 1230, heard AIR IS and ID, weak over some co-channel. This is Delhi, 250 kW, opening Sindh service to Pakistan at 334 degrees. Grayline map shows this more than an hour before sunset in Delhi, and half a sesquihour after sunrise here (1146). 334 would be favorable azimuth for us if it weren't across the dayside, so I assume back radiation across the nightside was the route. The great-circle path from Delhi to Enid runs about 5 degrees from the poles. At 1200, K-index was 3 with G1 geomagnetic storms, per SWPC. Heard same a few days later a few minutes later (gh, OK) I was also able to catch just a trace of AIR interval signal on 6165 just prior to 1230. My local sunrise was at 1042 April 28 (Steve Lare, MI, *ibid.*) Same could happen again from August

**INDONESIA** Kang Guru Radio English program on 9680: Sue Rodger of KGRE has been informed by RRI Jakarta that they have a new schedule: 0800-0820 UT on Wed. and Fri. (ex: 1000-1020 UT on Wed. and Sun.), which would explain why I have not heard them, and the new time is too early here. See [www.kangguru.org/broadcastschedule.html](http://www.kangguru.org/broadcastschedule.html) (Ron Howard, CA, WORLD OF RADIO)

**KOREA NORTH** Is that KCBS from 11680 down on 11677.03 at 2000-2100 UT? (Wolfgang Büschel, Germany, May 5, DXLD) 11677.2, KCBS, Pyongyang. Continuous music, very pleasant, 0935. Also on equally strong 9665.41 (Craig Seager, DX-Pedition in NSW, *Australian DX News*) 11677 // 9665 and 6100. Reception and audio quality better on 11677 (Takahito Akabayashi, Japan, BC-DX)

VOK English to NAM at 1315 on 11644 // 9335, and // 11710 of which 11644 is a spur matched by one on 11776 hitting Anguilla. 11644 only slightly weaker than 11710 which was stronger than usual, but more distortion and hum on 11644. Another day it was between 11645 and 11646 from 1300. Announced new summer sked, no change for NAM, but Eu at 13-14, 15-16, 18-19 and 21-22 moved to 13760, 15245 ex-7570 and 12015 (gh, OK) 15245.26v also puts spurs about 62 kHz away, 0700-0950 in Russian, 15183-15188 and 15302-15307 (Wolfgang Büschel, BC-DX)

Looks like English at 1800 on 13760 will collide with CRI also in English to Europe (José Miguel Romero2, Spain, DXLD)

[non] After a while on 6020, Shiokaze/Sea Breeze, JSR via Japan at 1400-1430 switched to its anti-jamming alternate, 6005, in English on a Wednesday, but het and splatter from Echo of Hope clandestine on 6003. I e-mailed Shiokaze about this, and after nine days they went back to 6020 (Ron Howard, CA, DXLD)

I received Voice of Free Radio (religious), new station for North Korea via Armenia on 15755 at \*1100-1130\* (Hiroshi via S. Hasegawa, NDXC) ID includes V-O-F pronounced in English (gh)

Radio Free Chosun, 1200-1300 via Armenia, moved from 15755 to 12125. Voice of Wilderness, 1300-1400 via Armenia moved from 15710 to 11570. And each adds an Irkutsk frequency, 11540 and 11640 respectively. Open Radio for North Korea, 2100-2200 on 9950 via Armenia. Free North Korea Radio: 1000-1100 9490 via Taiwan; 1400-1600 11560 and 1900-2100 7530 both via Tajikistan (S. Hasegawa, NDXC)

North Korea Reform Radio, 1300-1330 9950, 1330-1400 on 9585 both Taiwan 100 kW (DX Mix News, Bulgaria)

**LAOS** 6130, Lao National Radio, has English or French lessons most days around 1415-1430: English was heard on Mon, Tue, Fri, Sat, but this

may vary. English programs are "New Dynamic English" and "Functioning in Business" created by DynEd International for the VOA. Heard until early May, but likely fading out earlier in summer (Ron Howard, CA, WORLD OF RADIO) So maybe coming back in August+ (gh)

**MONGOLIA** 12085, Voice of Mongolia, in English missing for two weeks until late April, at 0930, repeated at 1530 with news, rap song in Mongolian and "Discover Mongolia" (Rumen Pankov, Bulgaria, *Australian DX News*) Huge signal, very listenable at 1531 (Craig Seager, NSW, *ibid.*)

**MOROCCO** With IBB gone from end of March, some R. Moroccan transmissions remained on the air via Briech frequencies in April, but by May those were gone too (gh) Nador site only, no Briech, just this: 0900-1500 15340 Eu, 1500-2200 15345 Af (WRTH Update) But times vary per European monitoring. Nador site also for Medi 1, on 9575, supposedly 110 degrees, not favorable for Europe unlike some Briech antennas (Wolfgang Büschel, DXLD)

**MYANMAR** On April 19, I heard a station on 5985.0 from 1416 to 1435, with EZL pop songs, in Asian language with poor reception, due to adjacent splatter. First thought the language was right for Myanmar Radio, but they did not change over to English as they normally do at 1430, so thought I must be wrong. There was no sign of anything on the usual 5985.83 (Ron Howard, CA, DXLD) RM was rock-solid on 5985.83 for many years (John Wilkins, CO, *Cumbre DX*) I received Myanmar Radio on 5985.00 (right on nominal frequency) at 1250-1600. English ID and service started at 1530 (S. Hasegawa, Japan, NDXC)

Also on new 5915 from around 2300 to past 1500, often // 5985 and some other times // 5040. On the first day, they were on 5815 instead until 0020. 2300-0000 China & 0040-0200 Vatican co-channel 5915 (Jose Jacob, S. India, DXLD) Vatican news moved to 9650 (K Raja, [dx\\_india.yg](http://dx_india.yg))

After the cyclone on May 2, all Yangan SW frequencies including 7185, 9730 were missing for several days; Defence station on 5770 in Taunggyi was missing more briefly (Jose Jacob, *ibid.*) 5985 first heard again May 8, 1348-1405, nonstop talk instead of EZL pop songs (Ron Howard, CA, DXLD)

**NEW ZEALAND** RNZI is a rare station with the flexibility to change frequencies every month to take advantage of best propagation or to avoid interference; the only problem is keeping up with the changes. In mid-April 6095 analog was replaced without notice by 6170 after 1300, due to interference from Chinese jamming and BBC on 6095. Keep an eye on [www.rnzi.com/pages/listen.php](http://www.rnzi.com/pages/listen.php) (gh)

**NIGERIA** VON, 15120, at 2045 in English, modulation not too bad but far below normal. Closing at 2059\* said it was the 60 Minutes show, and we could listen live at [www.voiceofnigeria.org](http://www.voiceofnigeria.org)

Website says Testing Live Transmission, via Flash popup, whose timer started running immediately, but nothing heard:

► [www.voiceofnigeria.org/voiceOfNigeria.html](http://www.voiceofnigeria.org/voiceOfNigeria.html) There are also mp3 links to *Sixty Minutes*, *World News*, and a bad one to VONScope. No live stream connected until next day at 1552, but it was AWFUL, worse than their SW modulation ever has been – big hum, buzzes, extreme distortion, extraneous phone-ringing noises, could not recognize language (gh)

**PAPUA NEW GUINEA** 3290 is supposed to be R. Central, but the programming actually heard there is the Karai service at least part of the time, as long as 4890 is off the air (Ian Baxter, Australia; Patrick Robic, Austria, DXLD)

QSLing Radio New Ireland, 3905: has two P O Boxes, 477 and 140, Kavieng, but not used, mail returned when not picked up! Sent report instead just to Radio New Ireland, Kavieng, New Ireland, Papua New Guinea, which went direct to station, and succeeded in getting a reply (Takahito Akabayashi, Japan, DXLD)

7324.96, Wantok Radio Light had been missing for a few weeks when heard April 21 at 0914, with ID and "positive uplifting messages" (Bryan Clark, NZ, DXLD) Also island music, Pidgin at 2303 (Phil Ireland, NSW, *Australian DX News*)

**PERU** Two stations are authorized for 4790, but only one had been active for months, Radio Visión, Chiclayo, which is all-night with religious programming and widely reported. Then in mid-April the other one came back (gh)

4790, La Nueva Atlántida, Iquitos at 2258-0230\* including at 2301 a newscast called *Hora Junta*; at 2330 strong het from Visión on 4790.2. Atlántida also heard at 1030 (Rafael Rodríguez, Colombia, *condigit.yg*) Both vary somewhat, but Atlántida is on the low side (gh) such as 4789.6 at 2330-2400+ (Bob Wilkner, FL, DXLD)

New one on 4805, R. San Juan, in San Juan Bautista, Ayacucho? 0055-0140, May 14, IDs OM, Peruvian waltz and huayño music, fair to good signal (Rogildo Fontenelle Aragão, Bolivia, DXLD) North Americans were hearing only Rdif. do Amazonas, Brasil (gh)

**POLAND** In the German mailbag program of May 15th listeners were told that the government wants to abolish the media fee. As a result, Polish Radio would have to finance itself totally by advertising. This would result in severe cuts in domestic programs and the end of external programs (Udo Jackenkroll, WWDXC via Kai Ludwig)

**PRIDNESTROVYE** See last month; Radio PMR's 12135 broadcasts to Europe at 1400-1700 are M-F, but 6040 to NAM at 2215-2345 are Sunday-Thursday; the latter also M-F local time (Harry Brooks, NE England, DXLD) Who wants to work late on a Friday night? So the 12135 airings could be a repeat of the 6040, backwards as this would seem. Or does it not make any difference? All the propaganda sounds the same (gh)



On Thu May 8 I heard the German at 2244 introduced as the program for Monday, 17 December 2007! Do they just play out whatever old stuff? Unclean audio with distortion on sibilants, sharp gating like in the old USSR days (Kai Ludwig, Germany, DXLD)

**RUSSIA** Another shortwave site to go: Samara – Well-placed sources hint that the Russian transmitter operator RTRS intends to close down its shortwave facilities at Samara, perhaps by the end of the current A08 season.

If so, it would be the third shut-down of a major SW site in the former Soviet Union, after Brovary (Ukraine) and Yekaterinburg. And it would by no means be a surprise. Just compare the amount of installed capacity with the remaining demand for airtime, if not for Samara in particular, for the facilities in European Russia altogether. It does not appear to be an exaggeration to call the situation precarious.

Samara still has old phone-quality feeds, accompanied by a nasty hiss, as if the equipment has now noticeably started to deteriorate (Kai Ludwig, Germany, DXLD)

The Samara site is surrounded by suburbs and dacha areas. So the property and construction firms are waiting in the wings. Samara was always of bad sound quality in past decade, and broadcasts will be easily taken over by Armavir Krasnodar capacity (Wolfgang Büschel, *ibid.*)

The imminent closure of Samara will surely mean an end to the strange anomaly of Radio Tatarstan. Did anyone listen anyway? (Dan Goldfarb, England, *ibid.*) The transmission is worth listening to for the exotic music played – usually during the last half hour. Hopefully some other site will carry it instead of Samara (Noel R. Green, England, *ibid.*)

GRTR Tatarstan: 0410-0500 15110, 0610-0700 9690, 0810-0900 11925. Other Samara clients in several languages are VOR, including English at 16-21 on 9890; Family Radio, TWR, IBRA, CRI, and clandestines for Ethiopia, peak usage ten frequencies at once (Kai Ludwig, Germany, DXLD)

**RWANDA** DW's Kigali relays sound fine on AM, but if you turn on the BFO, the carriers waver slightly, perhaps due to unstable power supply. We noticed this on 15420 at 2056, later changed to 15445, in Arabic; followed at 2059 by 15205 and 11865 in English (gh, OK)

**SLOVAKIA** My recent e-mail to RSI: "From what I've heard listening to Radio Slovakia International, Pete Miller is being encouraged to retire. Please reconsider and keep Mr. Miller on RSI. Mr. Miller gives RSI its friendly voice on the air waves. Mr. Miller, in my opinion, is unique in today's radio broadcasting. Perhaps, Mr. Miller is considered 'old fashioned.' However, one of the main reasons I listen to RSI is because of him. We need more people on the radio like Mr. Miller." (Kraig Krist, VA, DXLD)

**SOMALIA** [non] See last month; the new IRIN Radio service in Somali via South Africa at 1730-1745 soon moved off 9665, conflicting with Spain, to 9735, which got good reports from Europe (gh, WORLD OF RADIO) Louise Tunbridge of IRIN in Nairobi says they got zero response from Somalia on 9735, so were moving again from May 5 to 7290 (Dan Henderson, via Wolfgang Büschel, *ibid.*) Armchair listening on 7290, slight QRM (Büschel, Germany, DXLD) Changed again a week later to 13685 via Abu Dhabi, and also changed time to 0830-0845 (Henderson, BC-DX) So the odds are high it will have moved several times more by now!

Not to be confused with IRIS = Interactive Radio Program for Somalis in the Ogaden of Ethiopia, a.k.a. Radio Mustaqbal, which canceled all its transmissions, via South Africa, UAE (DX Mix News, Bulgaria)

**SPAIN** I ran into Justin Coe of REE here in Madrid. Says the English service has really been scaled back and perhaps won't last much longer. I hope the Zapatero government sees fit to keep it, even though RTVE has been a money-losing operation. With the large British community and the Americans who live here, more than 100,000 – there is really a need for more foreign and domestic English-language outlets (Marty Delfin, Spain, DXLD)

REE to phase out SW in favor of internet – (note that REE is a subsidiary of RNE which is a subsidiary of RTVE).

RTVE foresees transmitting R. Exterior content via Internet, by an undetermined date, and thus abandon gradually its SW transmissions to other countries. This part of RNE will extend its service on internet, but such content cannot be taken off SW abruptly due to agreements with other countries [as in relay exchanges with China?].

RTVE considers that the role of REE must be autonomous from RNE, and thus have its own content, not sucking info from elsewhere, but the content of the two stations will still have to be coordinated (Europapress via José Miguel Romero, DXLD)

For the first sesquimonth of A-08, REE's English to Africa at 2000 M-F on 11625 collided with Vatican's English to Africa also on 11625; they were audible at about equal level in OK. Spain's broadcast had been registered with HFCC as one hour later than it really appeared (gh) Per Antonio Buitrago of REE, they move May 15 to 11620 (José Bueno, Spain, DXLD) That's no improvement; now it collides with India to Europe (gh) REE at 2000 in English also heard on 9690, not the announced 9665 (Bill Hodges, GA, DXLD)

REE heard during the 21 UT hour on 17595 with new Portuguese service to Brazil, including Spanish lessons. Collides with WEWN English, but depending on skip, can override it. Also airs earlier at 18-19 on 17595 before WEWN comes on (gh, OK) O Espanhol no Brasil is bilingual, partly in Spanish, M-F (Célio Romais, *Panorama*)

REE's token newscast in "Lenguas Co-Oficiales," M-F 1240-1255, best on 15170 via Costa Rica, was sometimes incomplete; supposed to be 1240 Catalan, 1245 Galician, and 1250 Basque. Catalan was sometimes missing, and Basque really in Castilian! *Clásicos Populares* from Radio Uno, is now Mon, Tue and Wed only at 1305-1400, best here on 15170, 17595 (gh, OK)

**SUDAN** [non] Southern Sudan Interactive Radio Instruction, in English, new sked in May: M-F 0600-0630 15215-UAE, 15750-RSA; M-F 0630-0700 11905-Rwanda, 15760-UK. M/W/F 0630-0700 15530-UAE, 15660-RSA. M/W/F 1300-1330 12070, 15390, 15485 all via RSA (DX Mix News)

A-08 BBC *Darfur Salaam* in Arabic, all via Cyprus: 0500-0530 12015 13650; 1700-1730 15515 17585 (DX Mix News, Bulgaria)

**SWEDEN** The external service of Swedish Radio turns 70. On July 1, 1938, the first-ever broadcast from Stockholm directed abroad was in Swedish. A year later, programs in English and German went on air. See <http://snipurl.com/29dp9> (Media Network blog)

**TAIWAN** [and non] Big trouble. Radio Taiwan International revealed in late April that management was considering ending broadcasts to NAM on 5950 and 9680! They were seeking listener comments on whether it would be more convenient for us to listen to them on the internet. Comments to: [paula@rti.org.tw](mailto:paula@rti.org.tw) This is a never-ending nightmare (Chuck Ermatinger, Ian Baxter, DXLD)

It was already decided to end airtime exchange between RTI and WYFR as of June 30, as notified May 2 to German listeners on 7780, 15600. Unclear yet whether another SW relay could be used to NAM, such as Guiana French (Kai Ludwig, Germany, *ibid.*)

**TANZANIA** Sauti ya Injili, a Lutheran station, on its website says it plans to start low-power SW broadcasting from Moshi on the 7 or 9 MHz bands, having purchased and transported a used Russian transmitter. TWR Swaziland presently carries their programs, and it would have cost US\$1 million to buy a 50 kW transmitter (via Jari Savolainen, DXLD)

**UK** [non] BBC Mundo Radio via WHRI Furman, 9410, M-F at 1200-1300 in Spanish, contains: 1200 News, 1215 *Estudio Abierto*, condensed call-in shows from archives, sometimes with frank discussions of sex; 1230 *Efemérides* historical items; 1234 M/W/F *Los Clásicos*, unannounced classical music fill, exactly the same selections repeated all week; Tue/Thu BBC *Top Diez de la Semana*, pop music countdown. Also on 11860 Guiana French (gh)

**USA** WBCQ planned to use 15420 in A-08, but as we reported last month was blocked by Deutsche Welle. DW was persuaded to move by mid-May to 15445 for its Arabic via Rwanda hours, 18-21 UT, but not for the Russian hours at 14-16 via UK and UAE. So WBCQ moved again from 17495 to 15420-CUSB; it still collided with DW in the mornings, but was clear if weak in the afternoons, with that 'prophet' from Fence Lake, NM until 2100 (gh)

World Harvest Radio has added an "Angel 6" transmitter; it's really the third transmitter at WHRI Furman SC, a 100 kW unit moved in from Indiana. Schedules were jumbled, but much of the programming on 250 kW Angel 2 moved to 6, including *Hmong Lao Radio*, Sat/Sun 1300-1400, noticeably weaker (gh, OK)

On 4440, WSRC, Fair Bluff, NC, strong third harmonic of 1480 heard at 0350-0555 with very enjoyable old time radio dramas, and then bluegrass music. Outstanding signal, reaching 70 dB and full quieting (Richard Parker, PA, NASWA Journal)

Kevin Alfred Strom, the white supremacist and neo-Nazi who had a SW pirate, Voice of To-Morrow, and a program on WRNO and other SW stations, *American Dissident Voices*, was sentenced to 23 months in jail after pleading guilty to possession of child porn (*The Hook News* blog, via Strom's ex-wife, Kirsten Helene Kaiser, DXLD) See also [http://en.wikipedia.org/wiki/Kevin\\_Alfred\\_Strom](http://en.wikipedia.org/wiki/Kevin_Alfred_Strom) (Harry Helms, DXLD) And this month's *Outer Limits* - ed.

**VANUATU** After eight years in which most islands have not been able to receive Radio Vanuatu, the national broadcaster will return to speaking nationwide by the end of July when installation of new transmitters financed by aid should be completed (*Vanuatu Independent* via Gavin Robertson, BDXC-UK yg) I just visited the main island, Efate, and could only hear them on FM (Robertson, *ibid.*)

But: 7260, R. Vanuatu, Vila, weak to fair at 0652, heard with ID and into Bislama a week or two earlier. Much reduced strength (Craig Seager, NSW, *Australian DX News*)

**VATICAN** Vatican Radio continues to transmit a 3-minute English fragment at 2311 on 9600 before opening Vietnamese. Add that to your comprehensive English listings, even though it's not on their own schedule (gh)

**ZIMBABWE** [non] SW Radio Africa, at 1700-1900 on 12035, moved site from Norway to UK in late April, improving reception here; at 1832 heard manager Gerry Jackson reading a *Letter from Zimbabwe* on how bad things are there, such as people being whipped with bicycle chains, murdered (gh, OK)

Until the Next, Best of DX and 73 de Glenn!

# BROADCAST LOGS

NOTEWORTHY LOGS FROM OUR READERS

Gayle Van Horn, W4GVH

gaylevanhorn@monitoringtimes.com

<http://mt-shortwave.blogspot.com>

## 0058 UTC on 7400

BULGARIA: Radio Bulgaria. Station ID and interval signal into Bulgarian service of world news. S9 signal (Joe Wood, Greenback, TN). Audible 7345, 0345. SIO 333 English (Stewart MacKenzie, Huntington Beach, CA).

🔊 On demand audio [www.bnr.bg/](http://www.bnr.bg/)

## 0123 UTC on 7345

CZECH REPUBLIC: Radio Prague. Discussion on immigration to the Czech Republic. Station ID to postal and website addresses. Sign-off announcement into Spanish service at 0200. Signal S9-good (Wood). 9435, 2245 with features and ID (MacKenzie).

🔊 On-demand and streaming audio [www.radio.cz/en/](http://www.radio.cz/en/)

## 0217 UTC on 5009.98

MADAGASCAR: RTV Malagasy. Upbeat music to "Radio Malagasy" identification. Los Lobos tune *La Bamba* at 0230 during fair signal and reduced carrier on USB (Scott Barbour, Intervale, NH).

## 0257 UTC on 3200

SWAZILAND: Trans World Radio. English station identification and interval signal. Choral music to vernacular text for poor-fair signal quality. 3200, 0324-0330.\*; 4775, \*0400-0415. German sign-on with ID and choral music. Announcers religious text into hymns. Jazz style music at 0425 (Barbour). Website [www.twr.org/](http://www.twr.org/)

## 0333 UTC on 5980

MOROCCO: Radio Marocaine. Arabic. Round-table discussion at tune-in. Commercial string to Arabic music program with touch-tone effects and phone number. Program fanfare at 0358 crushed at 0359 by Radio Netherlands via Antilles sign-on. Signal fair-good (Barbour).

## 0350 UTC on 7350

VATICAN STATE: Voice of Russia relay. Announcer's text and intros to classical piano music by Tchaikovsky. SIO 333 (MacKenzie). Vatican Radio 7360, 0654-0700.\* News of African media and it's relation to African governments and culture. Station website address given to interval signal and sign-off. Fair signal quality (Barbour).

🔊 On-demand and streaming audio plus podcast. [www.radiovaticana.org/index.html](http://www.radiovaticana.org/index.html)

## 0513 UTC on 4914.95

BRAZIL: Rádio Difusora de Macapa. Portuguese announcements and text to Braz pop tunes. Numerous station identifications at 0513. Good signal SINPO 33333 (Jim Evans, Germantown, TN). Brazil's Rádio Clube Paranaense 6039.60, 0707-0730. Mostly US pop music tunes amid a few Brazilian pops. Station ID for fair signal quality.

🔊 Streaming audio [www.clubeb2.com.br/#](http://www.clubeb2.com.br/#)

Rádio Aparecida 5034.98, 0120-0140. Religious text // 9629.93 // 11855 all very weak (Brian Alexander, PA).

🔊 Streaming audio [www.radioaparecida.com.br/aparecidaOC/ara-dio.php](http://www.radioaparecida.com.br/aparecidaOC/ara-dio.php)

## 0559 UTC on 5995

MALI: ORTM. National anthem to French sign-on announcements over "tinny" instrumental music. Indigenous music from 0602. Signal poor-weak with 6000 Cuba splatter. Audible 5995, 2334-0001.\* Non-stop Afro music to 2340. French voice-overs alternating music. Anthem at 0001 with no fanfare preceding and no ID noted, makes this one presumed ORTM. Fair signal quality (John Wilkins, Wheat Ridge, CO). 9635, \*0803-0830. Abrupt sign-on to vernacular talk and local music (Alexander).

## 0910 UTC on 6115

CHINA: Haixia Zhi Sheng (Voice of the Strait) Chinese text and comments possibly about Tibet which included crowd noise. Signal fair. Other China stations audible: **China National Radio** 5925, 1000-1015+ Presumed **Voice of the Strait** 7280, 1135-1202. Mandarin ID and fanfare. Co-channel Russian transmitter tones at 1151 and **Voice of Russia** via Novosibirsk interval signal at 1200. **Unidentified Chinese service** 7280, \*1100 (Barbour). **CPBS Geermu** 4800, 1234-1238. Chinese. **CNR-1** with traditional music and poor signal with unusual CODAR interference. SINPO 22222 (Evans). 4830, 1235-1304 **China Huayi BC**, 4830, 1235-1304 (Ron Howard, Monterrey, CA). **Xinjiang PBS Urumqi** 3990, 2359-0023 // 4890 poor under CODAR interference (Barbour).

## 1220 UTC on 5010

INDIA: All India Radio-Thiruvananthapuram. Hindi service from male/female announcers opening a few bars of Indian music as signal faded. SINPO 24222. **AIR-Chennai** 4920, 1231-1238. Hindi. Co-channel interference from presumed China's PBS Xizang. SINPO 22222 (Evans). Website <http://allindiaradio.org/> audio currently not available.

## 1241 UTC on 7295

MALAYSIA: Traxx FM (Kajang). Presumed this station including pop music and English breaks - but couldn't understand program content. Very weak signal, have been looking for this one for a couple of weeks. Malaysia's RTM via Sarawak 6049.65, 1307-1309. Tentative log observed under HCJB's talk and music. Noted carriers for other Malaysian stations (Evans). Sarawak FM via RTM 7130, 1305-1333. Vernacular news to DJ's pop music program. Singing "Sarawak FM" jingles. Almost fair reception without usual interference from China's CNR-1. // 5030 doing well against China. "As-Salamu Alaykum" greetings. 7130, 1305-1333 (Howard). Website [www.traxxfm.net/index.htm](http://www.traxxfm.net/index.htm)

## 1303 UTC on 9450

GERMANY: Polskie Radio via Wertachtal relay. *News From Poland* with focus on Polish Prime Minister to visit U.S. and Egyptian leader visits Poland. Poor signal quality (Barbour).

## 1400 UTC on 3995.03

CLANDESTINE: Shiokeze. Noted in Korean this day with assorted talks by male/female duo for very good signal. Additional clandestine activity: **Echo of Hope** 6003, 1420-1440. Korean programming, good signal sandwiched between 600 and 6005 interference; // to 3985 and 6348. **Furusato no Kaze** via Tanshui 9780, \*1600-1630.\* Japanese text to 1629 ID and closing announcement. Mentions of email [info@rachi.go.jp](mailto:info@rachi.go.jp). Shift to Chinese at 1630. Fair/poor quality the next day. **SW Radio Africa** possibly via Kvitsoy. 12035, 1829-1859.\* **Africa Today** program in English. Very good signal to sign-off (Wilkins).

## 1427 UTC on 15140

OMAN: Radio Sultanate of Oman. Tune-in to pop music. Chimes/gongs to station ID at 1430. English news at 1431-1439, followed by pop music program. Weak signal but readable. Lost in the noise at 1445 (Alexander). Website [www.oman-tv.gov.om/](http://www.oman-tv.gov.om/)

## 1610 UTC on 13650

ZAMBIA: Christian Voice. *The Planet* program into pop music countdown. CVC promos to pop music, news, and interviews. Australian postal address to CVC news headlines at 1635. Mailtime segment to news at 1701, followed by frequency shift to 13590. Fair signal quality. Noted 13590, \*1706-1715.\* Scope news program of fair-good signal quality (Alexander). 13590, 2000-2100\* *The Edge* program of music and features to 2100 closedown (Wilkins). 4965, 2338-2350 *Focus on the Family* program. 9430 (Barbour). 9430, \*05000-0559\* (Alexander).

🔊 CVC streaming audio [www.christianvision.com/](http://www.christianvision.com/)

## 1800 UTC on 7370

PRIDNESTROVYE: Radio PMR, Kishinev. Opening English ID announcements to news items covering Moldova. Segment on local history, ID and contact information at 1813. French at 1815. Poor-fair signal. Audible 6240, \*2303-2315. English sign-on to newscast on local conflicts. French service at 2315, very good signal (Alexander).

## 2040 UTC on 6055

RWANDA: Radio Rwanda. Vernacular talks to Afro pop music. Announcers phone chat to abrupt sign-off. Fair signal level despite co-channel interference from Iran in Spanish via Lithuania. Rwanda somewhat stronger than Iran (Alexander). French 6055, 2055-2100.\* Afro pops to announcers sign-off routine and brief techno music bit at 2100. Poor signal mixing with co-channel Iran (Barbour).

*Thanks to our contributors – Have you sent in YOUR logs?  
Send to Gayle Van Horn, c/o Monitoring Times  
English broadcast unless otherwise noted.*



# PROGRAMMING SPOTLIGHT

WHAT'S ON WHEN AND WHERE?

Fred Waterer

[fredwaterer@monitoringtimes.com](mailto:fredwaterer@monitoringtimes.com)

[www.doghousecharlie.com/radio](http://www.doghousecharlie.com/radio)

## Sounds from "Downunder"

**R**adio Australia is one of the more popular broadcasters from around the world. Its familiar fanfare at the beginning of a newscast is as recognizable as the BBC's "Lilliburlero." In my listening experience it's been the home of great music, authoritative news and current affairs programming, as well as many entertaining features. And as a fan of foreign languages, Radio Australia presents a unique opportunity to hear the Tok Pisin (Pidgin) language of the South Pacific.

"It's worth noting that Australia was a leader in the use of short wave broadcasting to transmit overseas. In 1927 AWA conducted a series of transmissions to Britain. These regular broadcasts were heralded by a kookaburra's laugh – a practice that's still used by Radio Australia today." ([http://www.radio.adelaide.edu.au/intro/history\\_OZ-radio.pdf](http://www.radio.adelaide.edu.au/intro/history_OZ-radio.pdf))

Like Canada's shortwave radio service, Australia's was spurred on by the outbreak of the Second World War. Shortwave services from the Australian Broadcasting Corporation were inaugurated in December 1939. The impetus for the creation of an external broadcast service was to counter enemy propaganda, initially from Germany and later Japan.

"However, the ABC's transmitters were much weaker than the Japanese or German services. The transmitter of Amalgamated Wireless Australia near Sydney had 10 kilowatts of power, and stations VLR and VLW had 2 kW each. In 1941, following consultation between the British and Australian governments, a transmitter site in Shepparton, Victoria, was selected, in part because of a flat landscape and soil conductivity. The site was completed in 1944 with two 100 kW and one 50 kW transmitters. The station was formally named Radio Australia then." (Wikipedia)

I mentioned Radio Australia's popularity. Depending on how long one has been listening, most SWLs and DXers have a favorable opinion of the many varied programs broadcast over the years. For so many of those years, Radio Australia provided not only good programming, but also strong, reliable signals. Like so many other international broadcasters, Radio Australian programming has been hampered by difficulties in listening in the 21<sup>st</sup> Century. I asked a few of my listener friends for their thoughts on Radio Australia, most of which were in a similar vein.

"...in the mornings BC (before coffee) when I usually listen to RA – after switching on the computer – I have it on as basically soothing background drone and don't really have a favorite program/presenter (except for whoever is on during our mornings with that deep, reassuring voice). However, RA has a special place in my heart because 9580 was a reliable catch before school in the mornings back in 1966." (Anne Fanelli)

"Philip Adams is a real gem with *Late Night Live* and his interviews of folks across the cultural / political / spiritual / environmental divides. He frequently interviews (First name unrecalled) Shapiro of the *Nation*, and I recall such interviews with him after the 2000 election which were much more informative and insightful to the confusion caused by this election than anything heard domestically. Also, their programs *PM*, and *Asia Pacific*, and various interview programs are generally very good, as well as *Saturday Night Country* and (I am not sure I have the name right) the *Planet* (a wide variety of eclectic music.)" (Roger Chambers)

"...they don't come in (nearly) as well as they used to." (Brian Smith)

"Due to a bad noise problem here I don't do a lot of listening to Radio Australia. I used to love them in the afternoons and early evening but never hear them anymore. In the morning I can sometimes get them." (Mark Coady)

Like many international broadcasters, Radio Australia is making the move in a big way to the internet and other alternatives to shortwave. Sad, I guess for longtime DXers and SWLs, but time marches on. I must admit it's good to hear programming from this far-away country in near stereo quality.

Most programs are now available via shortwave, but also via re-broadcasters such as CBC Radio One and the World Radio Network; via satellite; and via the Radio Australia website, in fact, most if not all RA programs can be down-

**W.A. Short-wave services of AUSTRALIAN BROADCASTING CORPORATION**  
Box D9994 GPO Perth 6001

IDENT	FREQ.	METRE BAND	POWER	TIME	DAY
VLW 6	6140 KHZ	48	10 KW	5.0AM - 9AM 6.30AM - 9AM	MON-SAT SUNDAY
VLW 9	9610 KHZ	31	10 KW 50 KW 10 KW 50 KW	5.0AM TO 5.55PM 6.00PM - MIDNIGHT 5.55PM TO 6.00PM - MIDNIGHT	MON-SAT MON-SAT SUNDAY SUNDAY
VLW 15	15425 KHZ	19	50 KW	7.0AM TO 5.41PM	EVERY DAY

**POST CARD** Address only

Dear Sir,  
Your report on reception dated 1.2.85 has been examined. This confirms that you were listening to VLW 9 on 1.2.85 at 2135 W.A.T. 1885 G.M.T.

This transmitter is located at Wanneroo (near Perth) and operates on 9610 KHZ, 51.22 metres. Power 10 KW (watts).

Thank you for your interest in reporting on our transmission.

ABC Radio Yours faithfully,  
**THE AUSTRALIAN BROADCASTING CORPORATION**

Mr F. Waterer.

loaded as a podcast.

A few words about the Radio Australia website. It's had a major overhaul recently, which is both good and bad. Until quite recently you could download a .pdf file with the shortwave schedule, but no longer (at least I couldn't find it). There is an online "Program Guide," but what's not entirely clear to me is if the shortwave schedule mirrors exactly the "webstream" schedule. Be sure and check it out at [www.radioaustralia.net.au/](http://www.radioaustralia.net.au/)

As you can imagine, with a 24/7 schedule, Radio Australia has an abundance of quality programs, far too many to cover in just two pages. However, I have pointed out some highlights and sorted the programs into three categories. Of course, there is much more to be heard.

### MUSIC PROGRAMS

**Australia All Over** - About Australia, "An eclectic mix of music, poetry, anecdotes, book



readings and talkback." (Sat 1830, 2130)  
**Australian Country Style** – This is a wonderful show: John Nutting hosts the program heard both domestically and abroad. (Sun 0230, 0530, Fri 2030)  
**Jazz Notes** – Australian jazz. With Ivan Lloyd (Sat 0930)  
**Saturday Night Country** – "The music, the personalities and the very latest news from the Australian and international country music scene." John Nutting hosts (Sat 1200)  
**The Music Show** – "It's more than just music, and it's more than just talk." Host Andrew Ford (Sun 0900)

## FEATURES

**Artworks** – Weekly arts and culture program "looks at the big themes, views, issues and events in the arts in Australia and overseas." Hosted by Amanda Smith (Sun 0200, 0500, Fri 1430, Sat 0734)  
**Australia Talks** – "A daily national talkback programme." With Paul Barclay (Mon-Thurs 0900, 1600)  
**Australian Express** – "Climb aboard to learn more about Australia and what makes it tick." Hosted by someone familiar to a generation of shortwave listeners, Roger Broadbent (Tues 1330, 1700, Fri 1830, Sat 0030, 0400)  
**AWAY!** – "Indigenous issues and arts." Daniel Browing is host. (Tues 1400)  
**Big Ideas** – "Big Ideas brings you lectures, conversations, features and special series from Australia and around the world." (Mon 1400, Fri 1700)  
**Breakfast Club** – "Our live program for Asia brings you all the things that are good to wake up to - lively music, interesting people, entertainment news, sport, art, finance and weather." Phil Kafcaloudes & Adelaide Ng host. (Su-Thu 2130, 2240, M-F 0000, 0030)  
**In the Loop** – "Linking our Pacific neighbours with a lively mix of music, talk and the sounds of Oceania." Hosted by Isabelle Genoux & Clement Paligaru (Su 0100, 0400, M-F 0310, 0315, 0430, 1730, Sa 0000)  
**Late Night Live** – "Talk radio with a difference. Phillip Adams invites you to sit in on his conversations with the world's most controversial thinkers." (M-F 1200)  
**MovieTime** – This is a very entertaining film program hosted by Julie Rigg (Su 0330, 0630, Fri 1400)  
**Rear Vision** – "Get a better understanding of where we've been, where we are today and where we might be going." Hosted by Annabelle Quince & Keri Phillips (Su 0730, 1734, Thu 1330, 1700, Sat 0134)  
**Rural Reporter** – "Stories from the bush." Hosted by Ruth Archer (Wed 1330, 1700, Fri 1930)  
**Sunday Night Talk** – "A unique weekly programme exploring the issues, events and people driving developments in religion, ethics, spirituality, popular culture, values and beliefs in our country." Hosted by John Cleary (Sun 1200)  
**The Health Report** – "Making medicine understandable." With Dr. Norman Swan (Mon 1030, 1530, Tues 1030)

## CURRENT AFFAIRS

**AM** – "Australian national current affairs." The host is Tony Eastley (Su-Th 2100, 2200)  
**Asia Pacific** – "Current affairs program for Asia and the Pacific." Hosted by Linda Lopresti (M-F 1000, 1300, 1500)  
**Asia Review** – "A roundup of this week's regional current affairs." (Fri 1900, 2300, Sat 0200, 0500, 0900, 1100)  
**Background Briefing** – "Radio National's agenda-setting current affairs radio documentary program." (Sat 2300)

**Connect Asia** – "News, views and analysis on the stories that matter in Asia." (Sun-Thu 2300)  
**Correspondent's Notebook** – "A personal perspective on a major news story or current issue from the Asia Pacific region." (Sun 0705, Fri 2100)  
**Correspondents Report** – "The ABC's overseas reporters interpret and analyse the week's major events." Presented by Elizabeth Jackson (Sun 0800, Sat 1800, 2200)  
**Pacific Beat** – "News and current affairs about the Pacific." Afternoon Edition with Geraldine Coutts: (M-F 0500, 0700) Morning Edition with Myra Mortensen: (1800)  
**Pacific Beat** – On the Mat – "Where the Pacific comes together to chat and discuss issues of regional interest." (M-F 0535, 0735)  
**Pacific Review** – "A comprehensive roundup of the major stories from the region and the people involved and affected by them." (Fri 1800, 2200, Sat 0300, 0600)  
**Perspective** – "Opinion makers from Australia and overseas talk about issues which affect us all." (Sun 0725)  
**PM** – "A comprehensive current affairs roundup." Hosted by Mark Colvin (M-F 0800, 1110)  
**The National Interest** – "The major issues of the week." Host Peter Mares (Fri 0900, 1600)  
**The World Today** – "A comprehensive current affairs program, which backgrounds, analyses, interprets and encourages debate on events and issues of interest and importance to all Australians." Presented by Eleanor Hall (M-F 0200)

As a broadcaster with an extensive schedule, not all shortwave frequencies are going to reach North America. Consult the "Shortwave Guide" in this magazine, or the Radio Australia website. 6020, 7240, 9475, 9580, 9590 and 9710 kHz have been reported during North American mornings, usually the best time to listen.

## ❖ Personal Observations

In my opinion, Radio Australia is a top-notch broadcaster. Many shows focus on Asia and Pacific issues that frankly don't get enough coverage in North America. If I had a criticism, though, it's an overemphasis on current affairs. More music and culture, please.

Both Australia and Canada were influenced in the development of their broadcasting systems by Britain, developing a state broadcasting system on the BBC model, and a private radio

system based on the American model. As a result, Australia like Canada also has a thriving private sector broadcasting industry. For most of our lives, these stations were impossible to hear from North America, just exotic entries in the *WRTH*. But thanks to the internet, we can hear Australian stations as if they were local. One just has to remember the time difference. Not only is Australia on the "bottom" of the planet, but it's on the opposite side, making daytime in North America night time in Australia and vice versa.

One of the things you learn after listening to Australian radio for any length of time, is how similar the Australia media is to its North American counterparts, and at the same time how different it is. Isn't that a paradox? Well no.

Listening to music stations, while the tunes may sometimes vary, the sound is very similar to just about any North American music oriented station you can think of, except for the accent, of course.

This is also true for "talkback" radio, or what we would call "talk radio." Politically oriented programs tend to have a conservative "outraged" tone, but not always. While listening to 6PR in Perth, a few years ago I was both amazed and amused to note that almost all of the issues being discussed and blamed on the local Labour government, were exactly the same as those facing my own (Conservative) provincial government, at the time – with the same solutions, I might add.

How are radio stations different in Australia? For one, they aren't quite as "sanitized" as North American radio stations. Occasionally there is language that gets through that wouldn't here. Having said that, I've found, at least in my experience, that they don't shy away from religion. Some shows think nothing of sliding a Gospel tune or two for a regular listener. One 6PR host is also a social activist and a minister. Programs on 6PR and 3AW (Melbourne) even have listener get-togethers for their "radio families." Keith McGowan has a loyal following overnight on 3AW. He is a caring, popular host with a very quirky sense of humor. I'd encourage you to check out the local radio scene in Australia. It's lively, vibrant, and very entertaining.

And don't forget to check out the myriad of programs available via the Australian Broadcasting Corporation domestically. They are a click away at: [www.abc.net.au/](http://www.abc.net.au/)

# FREE SPEECH RADIO WBCQ Shortwave

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# THE QSL REPORT

VERIFICATIONS RECEIVED BY OUR READERS

Gayle Van Horn, W4GVH

gaylevanhorn@monitoringtimes.com

## Hot July QSLing

Back by request, it's the annual *Hot July QSLing* issue. No tips or offers ... just an issue of nothing but QSLs. Contributions are always

welcomed via email or regular mail, and an SASE is requested for personal replies. Good luck with your sizzling July QSLs.

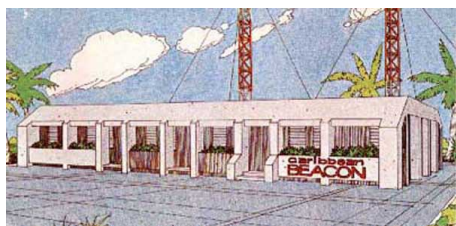
### AMATEUR RADIO

Belgium-ON41A, 10 meters SSB. Full data tri-color QSL card. Received in 462 days via ARRL bureau. (Larry Van Horn, NC).

Greece-SV2CXI, 20 meters SSB. Full data color card. Received in 189 days for a self-addressed-envelope and US\$1.00. QSL address: Kostas Vitsiotis, Papafi STR, GR 54 453, Thessaloniki, Greece (Van Horn).

### ANGUILLA

The Caribbean Beacon, 6090 kHz. Full data card signed by Doris McSingleton. Received in 325 days for an English report and US\$2.00. Station address: Attention: Reception Reports, P.O. Box 690, Anguilla, British West Indies. Email [beacon@anguillanet.com](mailto:beacon@anguillanet.com) (Joe Wood, Greenback, TN).



### ARGENTINA

RAE, 11710 kHz. Full data blue/white RAE card unsigned. Received in six months for an English report and US\$2.00. Station address: Casilla de Correo 555, C 1000 WAF, Buenos Aires, Argentina.

▶ Streaming audio for AM Radio Nacional, FM and RAE [www.radionacional.com.ar/](http://www.radionacional.com.ar/) (Tom Hillton, Charleston, SC)

### ARMENIA

Deutsche Welle relay, 9380 kHz. Full data Stuttgart Scholssplatz card which verified Armenia and Lviv, Ukraine for this frequency; 9865 kHz via WHRI Cypress Creek, SC verified in ten days. May be first time DW has used these three sites (Wendel Craighead, Prairie Village, KS).

### CHINA

China Huayi BC Company, 4830 kHz. Full data CHBC Shoushan Stone folder card, signed by Qiao Xiaoli-QSL Manager. Received in 16 days for US\$3.00. Card is in addition to e-QSL previously received. Station address: Fen Jin Xin Cun 3-4-304, Changshu, Jiangsu, 215500 Peoples Republic of China. (Ron Howard, Monterey, CA)

### CLANDESTINE

Shiokaze via Yamata, 6020 kHz. Full data blue-ribbon COMJAN JSR Shiokaze card without site notation. Received in 11 days for English report and audio clip emailed to [chosakai@circus.ocn.ne.jp](mailto:chosakai@circus.ocn.ne.jp) (Howard).

Southern Sudan Interactive Radio via Meyer-ton, 15675 kHz. Partial data letter signed by Kathy Otto. Received in ten weeks. QSL address: Transmission Planning, Private Bag X06,



Honeydew 2040, South Africa (Craighead).

### MEDIUM WAVE

BBC Humberside, 1485 kHz AM. Email verification from Simon Pattern-Managing Editor [simon.pattern@bbc.co.uk](mailto:simon.pattern@bbc.co.uk) Received for two UK mint stamps. Postal address: BBC Humber, Queen's Court, Hull, HU1 3RH United Kingdom. Station audible only recently since Haagstad Radio in The Haag, Netherlands left the air.

▶ Streaming audio [www.bbc.co.uk/humber/](http://www.bbc.co.uk/humber/) (Dave Onley, Pijnacker, Netherlands/UDXF).

BBC Three Counties Radio, 630 kHz AM. Letter from Mark Norman-Managing Editor. Received in 39 days for two UK mint stamps. Station address: BBC Beds, Herts & Bucks, 1 Hastings Street, Luton, LU1 5XL United Kingdom.

▶ Streaming and on-demand audio, plus live webcam [www.bbc.co.uk/threecounties/local\\_radio/](http://www.bbc.co.uk/threecounties/local_radio/) (Onley).

CHWO, 740 kHz AM. Beautiful certificate and QSL card signed by Brian Smith-QSL Manager. Souvenir bookmark and station profile on their 51<sup>st</sup> Anniversary. Received in 40 days. QSL address: Ontario DX Association, 155 Main Street-North, Suite 313, Newmarket, ON Canada L3Y 8C2. (Patrick Martin, Seaside, OR)

JOIR, 1260 kHz AM. Friendly letter unsigned, plus QSL card, key chain and program schedule. Received in 22 days for a CD report and US\$2.00. Station address: TBC, 26-1 Yagiya-ma Kasumicho, Taihaku-ku Sendai 982-0831, Japan (Martin).

WDSS, 1680 kHz. QSL form letter unsigned and Radio Disney 1680 sticker. Received in 11 days for a CD report. Station address: 3777 44<sup>th</sup> SE, Grand Rapids, MI 49512 USA (Martin).

WWVA, 1170 kHz. Paper QSL card signed by Leann M. Delong-Executive Asst./Promotions Director, plus two color coverage maps. Received in two years after four follow ups. Station address: Clear Channel Radio, 1015 Main Street #1, Wheeling, WV 26003 USA (Martin).

### SOUTH AFRICA

IRIN Radio, 9665 kHz. Email reply for broadcast to Somali. The coordinator is in Nairobi, Kenya, and advises listeners write to: [feedback@IRINnews.org](mailto:feedback@IRINnews.org) (Björn Fransson/HCDX).

▶ On-demand audio and podcast [www.irinnews.org/radio.aspx](http://www.irinnews.org/radio.aspx)

### UTILITY

African International Airways, 5517 kHz. DC8-62F Live cattle flight from Shannon, Ireland to Khartoum, Sudan. Full data paper QSL from email report to [aia@aiaflycargo.com](mailto:aia@aiaflycargo.com), plus mouse pad and color post card of scene inside DC8, complete with occupied cattle boxes. Airline specializes in flights carrying cattle and horses. UK address: 1, The Brunei Centre, Newton Road, Crawley, West Suffex RH10 9TU United Kingdom Additional company addresses and contact information at website [www.aiaflycargo.com/index.htm](http://www.aiaflycargo.com/index.htm) (Thomas Rösner, Germany/UDXF)

US BIZ Jet, Gibbs International Inc., 5616 kHz. Full data verification letter signed by Capt. Nate Earles-Chief Pilot. Gulfstream 400 used for company's VIP flights. Info received on this flight and mission from Greenville, SC to Stuttgart, Germany, including copy of flight's navigation tracking protocol chart with position during radio reception marked. Gibbs International is a textile machinery company, and this is a rare catch as N527JG is the only aircraft owned by Gibbs. Email report to [sales@gibbsinternational.com](mailto:sales@gibbsinternational.com) Airline address: Gibbs International, 2100 GSP Drive, Hangar One, Greer, SC 29651 USA. Website: [www.gibbsinternational.com/](http://www.gibbsinternational.com/) (Rösner).

HAARP, 6792.5 kHz. Color antenna array card, unsigned. Received in 100 days for reception of Moon Bounce test. Nice addition for unusual reception (Martin). 101 days for an SASE (Gil Woodside WAILAD; Jim Pogue, Memphis, TN). QSL address: P.O. Box 271, Gakona, AK 99583 USA.

### Coastal Station

VMC, 6507 kHz via Charleville, Queensland, Australia. E-QSL of attractive multi-colored flag/map card, with reception details and schedule. Received in 33 days from Mike Dalakis at [m.dalakis@bom.gov.au](mailto:m.dalakis@bom.gov.au) (John Wilkins, Wheat Ridge, CO).

### Non-Directional Beacons

ABG 404 kHz. Full data prepared QSL card returned as verified by Cliff Scott-Manager. Power listed as 25 watts. Received in eight days for an SASE. QSL address: ALERT Field Airport, 1 Academy Blvd., Big Sandy, TX 75755 (Pogue).

LDM 341 kHz. Full data prepared QSL card returned as verified by David Johnson-Airport Manager. Power listed as 25 watts. Received in 12 days for SASE. QSL address: Mason County Aviation FBO, 5300 W.US 10, Ludington, MI 49431 USA (Pogue).

PTB 284 kHz. Full data prepared QSL card returned as verified by Spencer L. Waddell-Airport Manager. Power listed as 25 watts. Received in 11 days for SASE. QSL address: Dinwiddie County Airport, 6775 Beck-Chappell Drive, Petersburg, VA 23803 USA (Pogue).



## HOW TO USE THE SHORTWAVE GUIDE

0000-0100 twhfa    USA, Voice of America    5995am    6130ca    7405am    9455af  
 ① ② ③ ④ ⑥ ⑦

### Convert your time to UTC.

Broadcast time on ① and time off ② are expressed in Coordinated Universal Time (UTC) – the time at the 0 meridian near Greenwich, England. To translate your local time into UTC, first convert your local time to 24-hour format, then add (during Daylight Saving Time) 4, 5, 6 or 7 hours for Eastern, Central, Mountain or Pacific Times, respectively. Eastern, Central, and Pacific Times are already converted to UTC for you at the top of each hour.

Note that all dates, as well as times, are in UTC; for example, a show which might air at 0030 UTC Sunday will be heard on Saturday evening in America (in other words, 8:30 pm Eastern, 7:30 pm Central, etc.).

### Find the station you want to hear.

Look at the page which corresponds to the time you will be listening. English broadcasts are listed by UTC time on ①, then alphabetically by country ③, followed by the station name ④. (If the station name is the same as the country, we don't repeat it, e.g., "Vanuatu, Radio" [Vanuatu].)

If a broadcast is not daily, the days of broadcast ⑤ will appear in the column following the time of broadcast, using the following codes:

Codes	
s/Sun	Sunday
m/Mon	Monday
t	Tuesday
w	Wednesday
h	Thursday
f	Friday
a/Sat	Saturday
occ:	occasional
DRM:	Digital Radio Mondiale
irreg	Irregular broadcasts
vl	Various languages
USB:	Upper Sideband

### Choose the most promising frequencies for the time, location and conditions.

The frequencies ⑥ follow to the right of the station listing; all frequencies are listed in kilohertz (kHz). Not all listed stations will be heard from your location and virtually none of them will be heard all the time on all frequencies.

Shortwave broadcast stations change some of their frequencies at least twice a year, in April and October, to adapt to seasonal conditions. But they can also change in response to short-term conditions, interference, equipment problems, etc. Our frequency manager coordinates published station schedules with confirmations and reports from

her monitoring team and MT readers to make the Shortwave Guide up-to-date as of one week before print deadline.

To help you find the most promising signal for your location, immediately following each frequency we've included information on the target area ⑦ of the broadcast. Signals beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible.

#### Target Areas

af:	Africa
al:	alternate frequency (occasional use only)
am:	The Americas
as:	Asia
ca:	Central America
do:	domestic broadcast
eu:	Europe
me:	Middle East
na:	North America
pa:	Pacific
sa:	South America
va:	various

### MT MONITORING TEAM

Gayle Van Horn

Frequency Manager

[gaylevanhorn@monitoringtimes.com](mailto:gaylevanhorn@monitoringtimes.com)

Larry Van Horn, MT Asst. Editor

[larryvanhorn@monitoringtimes.com](mailto:larryvanhorn@monitoringtimes.com)

## Thank You ...

### Additional Contributors to This Month's Shortwave Guide:

Rich D'Angelo/NASWA Flash Sheet; Rachel Baughn/MT; Alokesh Gupta, New Delhi, India; Anker Petersen/DSWCI-DX Window; Adrian Sainsbury/R NZ Intl; Ivo Ivanov; Tom Taylor, UK; Harold Sellers/ODXA/DX Ontario; Wolfgang Büeschel, Germany; Andreas Volk, Germany; Ardic DX Club; BCL News; Cumbre DX; AOKI; EIBI; BDX Club; DX Mix News, Bulgaria; Hard Core DX; NASWA Journal/NASWA Flashsheet; ;World Wide DX Club-Top News.

### Shortwave Broadcast Bands

kHz	Meters
2300-2495	120 meters (Note 1)
3200-3400	90 meters (Note 1)
3900-3950	75 meters (Regional band, used for broadcasting in Asia only)
3950-4000	75 meters (Regional band, used for broadcasting in Asia and Europe)
4750-4995	60 meters (Note 1)
5005-5060	60 meters (Note 1)
5730-5900	49 meter NIB (Note 2)
5900-5950	49 meter WARC-92 band (Note 3)
5950-6200	49 meters
6200-6295	49 meter NIB (Note 2)
6890-6990	41 meter NIB (Note 2)
7100-7300	41 meters (Regional band, not allocated for broadcasting in the western hemisphere) (Note 4)
7300-7350	41 meter WARC-92 band (Note 3)
7350-7600	41 meter NIB (Note 2)
9250-9400	31 meter NIB (Note 2)
9400-9500	31 meter WARC-92 band (Note 3)
9500-9900	31 meters
11500-11600	25 meter NIB (Note 2)
11600-11650	25 meter WARC-92 band (Note 3)
11650-12050	25 meters
12050-12100	25 meter WARC-92 band (Note 3)
12100-12600	25 meter NIB (Note 2)
13570-13600	22 meter WARC-92 band (Note 3)
13600-13800	22 meters
13800-13870	22 meter WARC-92 band (Note 3)
15030-15100	19 meter NIB (Note 2)
15100-15600	19 meters
15600-15800	19 meter WARC-92 band (Note 3)
17480-17550	17 meter WARC-92 band (Note 3)
17550-17900	17 meters
18900-19020	15 meter WARC-92 band (Note 3)
21450-21850	13 meters
25670-26100	11 meters

#### Notes

- Note 1 Tropical bands, 120/90/60 meters are for broadcast use only in designated tropical areas of the world.
- Note 2 Broadcasters can use this frequency range on a (NIB) non-interference basis only.
- Note 3 WARC-92 bands are allocated officially for use by HF broadcasting stations in 2007.
- Note 4 WRC-03 update. After March 29, 2009, the spectrum from 7100-7200 kHz will no longer be available for broadcast purposes and will be turned over to amateur radio operations worldwide.

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# 0000 UTC - 8PM EDT / 7PM CDT / 5PM PDT

0000	0000	UK, BBC World Service	5970as	6195as
		7105as	9410as	9740as
		15335as	15360as	17615as
0000	0005	Canada, R Canada International	6100na	
0000	0020	Japan, NHK World/Radio Japan	5920eu	
		6145na	13650as	17810as
0000	0027	Czech Rep, Radio Prague	7345na	9440na
0000	0030	Australia, HCJB Global	15525as	
0000	0030	mtwhfa Serbia, International Radio Serbia	6185na	
0000	0030	Thailand, Radio Thailand	9680af	
0000	0030	USA, Voice of America	7555as	
0000	0045	Egypt, Radio Cairo	9280eu	
0000	0045	India, All India Radio	9705as	9950as
		11620as	11645as	13605as
0000	0045	USA, WYFR/Family Radio Worldwide	17805sa	
0000	0056	Romania, R Romania International	9775na	
		11790na		
0000	0057	Canada, R Canada International	11700as	
0000	0057	Netherlands, Radio Netherlands	9845na	
0000	0100	Anguilla, Worldwide Univ Network	6090am	
0000	0100	Australia, ABC NT Alice Springs	2310do	
		4835do		
0000	0100	Australia, ABC NT Katherine	5025do	
0000	0100	Australia, ABC NT Tennant Creek	4910do	
0000	0100	Australia, Radio Australia	9660as	12080as
		13690as	15240pa	17715as
		17775va	17795va	17750va
0000	0100	Canada, CFVP Calgary AB	6030na	
0000	0100	Canada, CKZN St John's NF	6160na	
0000	0100	Canada, CKZU Vancouver BC	6160na	
0000	0100	China, China Radio International	6020na	
		6075as	6180as	7130eu
		11885as	13750as	15125as
0000	0100	Costa Rica, Worldwide Univ Network	5030va	
		6150va	7375va	9725va
0000	0100	Germany, Deutsche Welle	9885as	15595as
		17525as		
0000	0100	Guyana, Voice of Guyana	3291do	
0000	0100	Malaysia, RTM/Traxx FM	7295as	
0000	0100	DRM New Zealand, Radio NZ International	15720pa	
0000	0100	New Zealand, Radio NZ International	13840pa	
0000	0100	vi Papua New Guinea, Wantok R. Light	7325va	
0000	0100	Singapore, MediaCorp Radio	6150do	
0000	0100	Spain, Radio Exterior Espana	6055na	
0000	0100	Ukraine, R Ukraine International	7440na	
0000	0100	USA, American Forces Radio	4319usb	5446usb
		5765usb	6350usb	7811usb
		12132usb	13362usb	10320usb
0000	0100	Sat USA, WBCQ Monticello ME	15420am	17495am
0000	0100	USA, WBCQ Monticello ME	5110am	7415am
		9330am		
0000	0100	USA, WBOH Newport NC	5920am	
0000	0100	USA, WEWN Vandiver AL	11520va	
0000	0100	USA, WHRA Greenbush ME	5850eu	
0000	0100	USA, WHRI Cypress Creek SC	5875na	
0000	0100	USA, WHRI Cypress Creek SC	11735na	
0000	0100	USA, WHRI Cypress Creek SC	7315am	
0000	0100	USA, WINB Red Lion PA	9265am	
0000	0100	USA, WRMI Miami FL	9955am	
0000	0100	USA, WTJC Newport NC	9370na	
0000	0100	USA, WWCR Nashville TN	5070na	5935na
		7465na	9980na	
0000	0100	USA, WWRB Manchester TN	3185va	5050va
		5745va	6180va	
0000	0100	USA, WYFR/Family Radio Worldwide	6985na	
		9505na	11835ca	
0000	0100	Zambia CVC Intl/Christian Voice	4965af	
0005	0057	twhfa Canada, R Canada International	6100na	
0030	0045	twhfes Albania, Radio Tirana	9390na	
0030	0045	Sun Germany, Pan American BC	9640as	
0030	0100	Australia, Radio Australia	15415as	
0030	0100	China, China Radio International	11730as	
0030	0100	Lithuania, Radio Vilnius	11690na	
0030	0100	Thailand, Radio Thailand	12120na	
0030	0100	UK, Bible Voice BC	9490as	
0030	0100	fas USA, Voice of America	9715va	9780va
		11725va	15185va	15205va
		15560va	17820va	15290va

# 0100 UTC - 9PM EDT / 8PM CDT / 6PM PDT

0100	0105	twhfa Canada, R Canada International	6100na	
0100	0127	China, China Radio International	11730as	
0100	0127	Czech Rep, Radio Prague	6200na	7345na
0100	0127	Slovakia, R Slovakia International	5930na	
		9440sa		
0100	0128	Vietnam, Voice of Vietnam	6175na	

0100	0130	Australia, Radio Australia	17775as	
0100	0130	mtwhfa Serbia, International Radio Serbia	6185na	
0100	0155	Turkey, Voice of Turkey	9620am	
0100	0157	China, China Radio International	6020na	
		6175as	9470eu	9535as
		9580na	9790na	11870as
0100	0157	Netherlands, Radio Netherlands	9845na	
0100	0158	DRM New Zealand, Radio NZ International	15720pa	
0100	0158	New Zealand, Radio NZ International	13840pa	
0100	0159	Canada, R Canada International	9620as	
0100	0200	Anguilla, Worldwide Univ Network	6090am	
0100	0200	Australia, ABC NT Katherine	5025do	
0100	0200	Australia, ABC NT Tennant Creek	4910do	
0100	0200	Australia, Radio Australia	9660as	12080as
		13690as	15240pa	15415as
		17795va		17715as
0100	0200	Canada, CFVP Calgary AB	6030na	
0100	0200	Canada, CKZN St John's NF	6160na	
0100	0200	Canada, CKZU Vancouver BC	6160na	
0100	0200	Costa Rica, Worldwide Univ Network	5030va	
		6150va	7375va	9725va
0100	0200	Cuba, Radio Havana Cuba	6000na	6180na
0100	0200	Guyana, Voice of Guyana	3291do	
0100	0200	Indonesia, Voice of Indonesia	9525al	11785pa
		15150as		
0100	0200	Malaysia, RTM/Traxx FM	7295as	
0100	0200	North Korea, Voice of Korea	4405as	7140as
		9345as	9730as	11735am
		15180am		12760am
0100	0200	vi Papua New Guinea, Wantok R. Light	7325va	
0100	0200	Russia, Voice of Russia	7250na	9665na
		13755na	15425na	
0100	0200	Singapore, MediaCorp Radio	6150do	
0100	0200	Sri Lanka, SLBC	6005as	9770as
0100	0200	Taiwan, R Taiwan International	11875as	
0100	0200	UK, BBC World Service	7320as	9410as
		9740as	11750as	11955as
		15335as	15360as	17615as
0100	0200	USA, American Forces Radio	4319usb	5446usb
		5765usb	6350usb	7811usb
		12133usb	13362usb	10320usb
0100	0200	USA, KWHR Naalehu HI	17800as	
0100	0200	USA, Voice of America	7430va	9780va
		11705as		
0100	0200	USA, WBCQ Monticello ME	5110am	7415am
		9330am		
0100	0200	USA, WBOH Newport NC	5920am	
0100	0200	USA, WEWN Vandiver AL	11520va	
0100	0200	USA, WHRA Greenbush ME	5850eu	
0100	0200	USA, WHRI Cypress Creek SC	5875na	11735na
0100	0200	USA, WHRI Cypress Creek SC	7315am	
0100	0200	USA, WHRI Cypress Creek SC	5875na	
0100	0200	USA, WINB Red Lion PA	9265am	
0100	0200	USA, WRMI Miami FL	9955am	
0100	0200	USA, WTJC Newport NC	9370na	
0100	0200	USA, WWCR Nashville TN	5070na	5935na
		7465na	9980na	
0100	0200	USA, WWRB Manchester TN	3185va	5050va
		5745va	6180va	
0100	0200	USA, WWRB Manchester TN	3185va	5050va
		5745va	6180va	
0100	0200	USA, WYFR/Family Radio Worldwide	6985na	
		9505na	15195as	
0100	0200	Uzbekistan, CVC International	11790as	
0100	0200	Zambia, CVC Intl/Christian Voice	4965af	
0130	0200	Iran, Voice of the Islamic Rep of Iran	7235na	
		9495na		
0130	0200	Sweden, Radio Sweden	6010na	
0130	0200	twhfa USA, Voice of America	6040va	9820va
0140	0200	Vatican City, Vatican Radio	9650na	
0145	0200	twhfes Albania, Radio Tirana	9390na	
0159	0200	New Zealand, Radio NZ International	15720pa	

# 0200 UTC - 10PM EDT / 9PM CDT / 7PM PDT

0200	0230	Iran, Voice of the Islamic Rep of Iran	7235na	
		9495na		
0200	0230	South Korea, KBS World Radio	9580sa	
0200	0230	Thailand, Radio Thailand	15275na	
0200	0245	USA, WYFR/Family Radio Worldwide	11835ca	
0200	0257	China, China Radio International	11770as	
		13640as		
0200	0259	Sun Lithuania, Mighty KBC Radio	6055na	
0200	0300	Anguilla, Worldwide Univ Network	6090am	
0200	0300	mtwhf Argentina, RAE	11710am	
0200	0300	Australia, ABC NT Alice Springs	2310do	
		4835do		
0200	0300	Australia, ABC NT Katherine	5025do	
0200	0300	Australia, ABC NT Tennant Creek	4910do	

0200	0300	Australia, Radio Australia	9660as	12080as	
		13690as	15240pa	15415as	15515as
		17750va	21725va		
0200	0300	Bulgaria, Radio Bulgaria	9700na	11700na	
0200	0300	Canada, CFVP Calgary AB	6030na		
0200	0300	Canada, CKZN St John's NF	6160na		
0200	0300	Canada, CKZU Vancouver BC	6160na		
0200	0300	Costa Rica, Worldwide Univ Network	5030va		
		6150va	7375va	9725va	
0200	0300	Cuba, Radio Havana Cuba	6000na	6180na	
0200	0300	Egypt, Radio Cairo	7270na		
0200	0300	Guyana, Voice of Guyana	3291do		
0200	0300	Malaysia, RTM/Traxx FM	7295as		
0200	0300	New Zealand, Radio NZ International	15720pa		
0200	0300	New Zealand, Radio NZ International	13840pa		
0200	0300	North Korea, Voice of Korea	3560as	13650as	
		15100as			
0200	0300	Papua New Guinea, Wantok R. Light	7325va		
0200	0300	Philippines, Radio Pilipinas	12025va	15285va	
		17770va			
0200	0300	Russia, Voice of Russia	9480na	9665na	
		9860na	13635na	15425na	
0200	0300	Singapore, MediaCorp Radio	6150do		
0200	0300	Sri Lanka, SLBC	6005as	9770as	15745as
0200	0300	Taiwan, R Taiwan International	5950na		
		9680na			
0200	0300	UK, BBC World Service	6035af	6195as	
		9410va	11955as	15310as	
0200	0300	USA, American Forces Radio	4319usb	5446usb	
		5765usb	6350usb	7811usb	10320usb
		12133usb	13362usb		
0200	0300	USA, KJES Vado NM	7555na		
0200	0300	USA, KJES Vado NM	7555na		
0200	0300	USA, KWHR Naalehu HI	17800as		
0200	0300	USA, Voice of America	9780va	11705va	
0200	0300	USA, WBCQ Monticello ME	5110am	7415am	
		9330am			
0200	0300	USA, WBOH Newport NC	5920am		
0200	0300	USA, WEWN Vandiver AL	11520va		
0200	0300	USA, WHRA Greenbush ME	5850eu		
0200	0300	USA, WHRI Cypress Creek SC		7315am	
0200	0300	USA, WHRI Cypress Creek SC		5875na	
0200	0300	USA, WHRI Cypress Creek SC		7385na	
0200	0300	USA, WINB Red Lion PA	9265am		
0200	0300	USA, WRMI Miami FL	9955am		
0200	0300	USA, WTJC Newport NC	9370na		
0200	0300	USA, WWCN Nashville TN	3215na	5070na	
		5890na	5935na		
0200	0300	USA, WWRB Manchester TN	3185va	5050va	
		5745va	6180va		
0200	0300	USA, WYFR/Family Radio Worldwide	5985am		
		6985na	9505na	11855am	
0200	0300	Uzbekistan, CVC International		11790as	
0200	0300	Zambia, CVC Intl/Christian Voice		4965af	
0215	0230	Nepal, Radio Nepal	5005as		
0230	0257	China, China Radio International		15435me	
0230	0258	Vietnam, Voice of Vietnam	6175ca		
0230	0300	Albania, Radio Tirana	7425na		
0230	0300	Netherlands, Radio Netherlands		11550as	
0230	0300	South Korea, KBS World Radio		9560na	
0230	0300	Sweden, Radio Sweden		11550va	
0245	0300	Myanmar, Myanma Radio	6010na		
0250	0300	Vatican City, Vatican Radio	9730do		
0255	0300	Rwanda, Radio Rwanda	6040na	7305na	
			6055do		

### 0300 UTC - 11PM EDT / 10PM CDT / 8PM PDT

0300	0315	vi	Croatia, Croatian Radio	9925na	
0300	0319		Vatican City, Vatican Radio	6040na	7305na
0300	0327		Czech Rep, Radio Prague	7345na	9870na
0300	0327		Vatican City, Vatican Radio	7360af	9660af
0300	0330		Egypt, Radio Cairo	7270na	
0300	0330		Myanmar, Myanma Radio	9730do	
0300	0330		Philippines, Radio Pilipinas	12025va	15285va
			17770va		
0300	0330		Sri Lanka, SLBC	6005as	9770as
0300	0330	Sun	Swaziland, Trans World Radio		3200af
0300	0330	mtwhf	UK, Sudan Radio Service	5975af	
0300	0330		USA, KJES Vado NM	7555na	
0300	0330		USA, WBCQ Monticello ME	5110am	7415am
			9330am		
0300	0355		South Africa, Channel Africa	3345af	6135af
0300	0355		Turkey, Voice of Turkey	5975am	7265va
			7325na		
0300	0356		Romania, R Romania International		6150na
			9645na	9735as	11895as
0300	0357		China, China Radio International		9690na
			9790na	15110as	11770as
			15120as	15785as	13750as

0300	0400		Anguilla, Worldwide Univ Network	6090am	
0300	0400		Australia, ABC NT Alice Springs	2310do	
			4835do		
0300	0400		Australia, ABC NT Katherine	5025do	
0300	0400		Australia, ABC NT Tennant Creek	4910do	
0300	0400		Australia, Radio Australia	9660as	12080as
			13690as	15240pa	15415as
			17750va	21725va	15515as
0300	0400	twhf	Canada, CBC NQ SW Service	9625na	
0300	0400		Canada, CFVP Calgary AB	6030na	
0300	0400		Canada, CKZN St John's NF	6160na	
0300	0400		Canada, CKZU Vancouver BC	6160na	
0300	0400		Costa Rica, Worldwide Univ Network	5030va	
			6150va	7375va	9725va
0300	0400		Cuba, Radio Havana Cuba	6000na	6180na
0300	0400		Germany, Deutsche Welle	13770as	15595as
0300	0400		Guyana, Voice of Guyana	3291do	
0300	0400		Malaysia, RTM/Traxx FM	7295as	
0300	0400		Malaysia, RTM/Voice of Malaysia		6175as
			9750as	15295as	
0300	0400		Netherlands, Radio Netherlands		6165na
0300	0400		New Zealand, Radio NZ International		15720pa
0300	0400	DRM	New Zealand, Radio NZ International		13840pa
0300	0400		North Korea, Voice of Korea	4405as	7140as
			9345as	9730as	
0300	0400		Oman, Radio Oman	15355as	
0300	0400	vi	Papua New Guinea, Wantok R. Light	7325va	
0300	0400		Russia, Voice of Russia	5900na	9800na
			9435na	9480na	9665na
			12065na	15735as	9860na
0300	0400	vi	Rwanda, Radio Rwanda	6055do	
0300	0400		Singapore, MediaCorp Radio	6150do	
0300	0400		Taiwan, R Taiwan International		5950na
			15215sa	15320as	
0300	0400		UK, BBC World Service	3255af	6005af
			6145af	6190af	6195as
			9410va	9750af	7160af
			15310as	17790as	15360as
0300	0400		Ukraine, R Ukraine International		7440na
0300	0400		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb
			12133usb	13362usb	10320usb
0300	0400		USA, KWHR Naalehu HI	17800as	
0300	0400		USA, Voice of America	4930af	6080af
			9885af	12085af	15580af
0300	0400		USA, WBOH Newport NC	5920am	
0300	0400		USA, WEWN Vandiver AL	11520va	
0300	0400		USA, WHRA Greenbush ME	5850eu	
0300	0400	twhf	USA, WHRI Cypress Creek SC		5875na
			6110am		
0300	0400	sm	USA, WHRI Cypress Creek SC		7315am
			7385na		
0300	0400		USA, WRMI Miami FL	9955am	
0300	0400		USA, WTJC Newport NC	9370na	
0300	0400		USA, WWCN Nashville TN	3215na	5070na
			7465na	5935na	
0300	0400		USA, WWRB Manchester TN	3185va	5050va
			5745va	6180va	
0300	0400		USA, WYFR/Family Radio Worldwide		6085na
			9505na	11740sa	15255sa
0300	0400		Uzbekistan, CVC International		13680as
			15515as		
0300	0400		Zambia, CVC Intl/Christian Voice		4965af
0330	0335		Bahrain, Radio Bahrain	6010as	
0330	0357		Czech Rep, Radio Prague	6080na	9445as
			11600as		
0330	0358		Vietnam, Voice of Vietnam	6175ca	
0330	0400	twhf	Albania, Radio Tirana	7425na	
0330	0400		UK, BBC World Service	11945af	

### 0400 UTC - 12AM EDT / 11PM CDT / 9PM PDT

0400	0430	mtwhf	France, Radio France International	9805af	
			11995af		
0400	0430		Netherlands, Radio Netherlands	9575af	
0400	0430		USA, KWHR Naalehu HI	17800as	
0400	0430		USA, Voice of America	4930af	4960af
			6080af	9575af	11835af
			15580af		12080af
0400	0430		USA, WWRB Manchester TN	3185va	
0400	0445		USA, WYFR/Family Radio Worldwide		6985na
			9505na		
0400	0457		China, China Radio International	6020na	
			6080as	13750as	15120as
			17730as	17855as	15785as
0400	0457		Netherlands, Radio Netherlands		6165na
0400	0458		New Zealand, Radio NZ International		15720pa
0400	0458	DRM	New Zealand, Radio NZ International		13840pa
0400	0459		South Africa, Channel Africa	3345af	



0400	0500		Anguilla, Worldwide Univ Network	6090am	
0400	0500		Australia, ABC NT Alice Springs	2310do	
			4835do		
0400	0500		Australia, ABC NT Katherine	5025do	
0400	0500		Australia, ABC NT Tennant Creek	4910do	
0400	0500		Australia, Radio Australia	9660as	12080as
			13690as	15240pa	15415as
			21725va		17750va
0400	0500	twhf	Canada, CBC NQ SW Service	9625na	
0400	0500		Canada, CKZN St John's NF	6160na	
0400	0500		Canada, CKZU Vancouver BC		6160na
0400	0500		Costa Rica, Worldwide Univ Network	5030va	
			6150va	7375va	9725va
0400	0500		Cuba, Radio Havana Cuba	6000na	6180na
0400	0500		Germany, Deutsche Welle	7225af	7245af
			12045af	15445af	
0400	0500		Guyana, Voice of Guyana	3291do	
0400	0500		Malaysia, RTM/Traxx FM	7295as	
0400	0500		Malaysia, RTM/Voice of Malaysia		6175as
			9750as	15295as	
0400	0500		Netherlands, Radio Netherlands	12080af	
0400	0500	vl	Papua New Guinea, Wantok R. Light	7325va	
0400	0500		Russia, Voice of Russia	5900na	9800na
			9665na	9860na	13635na
					15735as
0400	0500	vl	Rwanda, Radio Rwanda	6055do	
0400	0500		Singapore, MediaCorp Radio	6150do	
0400	0500	vl	Uganda, UBC Radio	4976do	5026do
0400	0500	DRM	UK, BBC World Service	5875eu	
0400	0500		UK, BBC World Service	3255af	6005af
			6190af	6195va	7120af
			11945af	12035va	12095as
			15565va	17790as	15360as
0400	0500		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb
			12133usb	13362usb	10320usb
0400	0500	mtwhfa	USA, WBCQ Monticello ME	7415am	
0400	0500		USA, WBOH Newport NC	5920am	
0400	0500		USA, WEWN Vandiver AL	11520va	
0400	0500		USA, WHRA Greenbush ME	5850eu	
0400	0500		USA, WHRI Cypress Creek SC		7315am
			7365am		
0400	0500		USA, WRMI Miami FL	9955am	
0400	0500		USA, WTJC Newport NC	9370na	
0400	0500		USA, WWCR Nashville TN	3215na	5070na
			7465na	5935na	
0400	0500		USA, WWRB Manchester TN	3185va	
0400	0500		USA, WYFR/Family Radio Worldwide		6915na
			7780va	9715ca	
0400	0500		Uzbekistan, CVC International		13680as
			15515as		
0400	0500		Zambia, CVC Intl/Christian Voice		4965af
0430	0500		Australia, Radio Australia	15415as	
0430	0500	mtwh	Italy, IRRS	5990va	
0430	0500		Nigeria, Radio Nigeria/Kaduna		6090do
0430	0500	mtwhf	Swaziland, Trans World Radio		3200af
			4775af		
0459	0500		New Zealand, Radio NZ International		9615pa
0459	0500	DRM	New Zealand, Radio NZ International		9890pa

### 0500 UTC - 1AM EDT / 12AM CDT / 10PM PDT

0500	0507	twhf	Canada, CBC NQ SW Service	9625na	
0500	0527		Vatican City, Vatican Radio	9660af	11625af
			13765af		
0500	0529		Vatican City, Vatican Radio	5965eu	7250eu
0500	0530	mtwhf	France, Radio France International		13680af
			15160af		
0500	0530		Germany, Deutsche Welle	9700af	9825me
0500	0530		Japan, NHK World/Radio Japan	5975eu	
			6110na	11970af	15325as
					17810as
0500	0555		South Africa, Channel Africa	7230af	9735af
0500	0557		China, China Radio International		6020na
			6190na	11880as	15350as
			17505me	17730as	17855as
0500	0600		Anguilla, Worldwide Univ Network		6090am
0500	0600		Australia, ABC NT Alice Springs		2310do
			4835do		
0500	0600		Australia, ABC NT Katherine	5025do	
0500	0600		Australia, ABC NT Tennant Creek		4910do
0500	0600		Australia, Radio Australia	9660as	12080as
			13630as	13690pa	15160as
			17750va		15240pa
0500	0600		Bhutan, Bhutan Broadcasting Svc		6035as
0500	0600		Canada, CKZN St John's NF	6160na	
0500	0600		Canada, CKZU Vancouver BC		6160na
0500	0600		Costa Rica, Worldwide Univ Network		5030va
			6150va	7375va	9725va
0500	0600		Cuba, Radio Havana Cuba	6000na	6060na
			6180na	9550na	11760am

0500	0600		Guyana, Voice of Guyana	3291do	
0500	0600		Malaysia, RTM/Traxx FM	7295as	
0500	0600		Malaysia, RTM/Voice of Malaysia		6175as
			9750as	15295as	
0500	0600		New Zealand, Radio NZ International		9615pa
0500	0600	DRM	New Zealand, Radio NZ International		9890pa
0500	0600		Nigeria, Radio Nigeria/Kaduna		4770do
0500	0600	vl	Papua New Guinea, Wantok R. Light		7325va
0500	0600		Russia, Voice of Russia	17635pa	21790pa
0500	0600		Singapore, MediaCorp Radio	6150do	
0500	0600		Swaziland, Trans World Radio		3200af
0500	0600		Swaziland, Trans World Radio		4775af
			6120af	9500af	
0500	0600	vl	Uganda, UBC Radio	4976do	5026do
0500	0600		UK, BBC World Service	3255af	6005af
			6190af	6195va	7120af
			9410va	11945af	12095as
			15360as	15420af	15565va
			17790as		17640af
0500	0600	DRM	UK, BBC World Service	6195af	
0500	0600		Ukraine, R Ukraine International		9945eu
0500	0600		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb
			12133usb	13362usb	10320usb
0500	0600	mtwhfa	USA, KWHR Naalehu HI	13650as	
0500	0600		USA, Voice of America	4930af	6080af
			6180af	12080af	15580af
0500	0600		USA, WBCQ Monticello ME	5110am	
0500	0600		USA, WBOH Newport NC	5920am	
0500	0600		USA, WEWN Vandiver AL	11520va	
0500	0600		USA, WHRA Greenbush ME	7490va	
0500	0600		USA, WHRI Cypress Creek SC		7315am
			7365am		
0500	0600		USA, WRMI Miami FL	9955am	
0500	0600		USA, WTJC Newport NC	9370na	
0500	0600		USA, WWCR Nashville TN	3215na	5070na
			7465na	5935na	
0500	0600		USA, WWRB Manchester TN	3185va	
0500	0600		USA, WYFR/Family Radio Worldwide		6915na
			9355va		
0500	0600		Uzbekistan, CVC International		13680as
			15515as		
0500	0600		Zambia, CVC Intl/Christian Voice		4965af
			9430af		
0515	0530	vl	Rwanda, Radio Rwanda	6055do	
0530	0556		Romania, R Romania International		9655eu
			11830eu	15435pa	17770pa
0530	0600		Australia, Radio Australia	15415as	
0530	0600	vl	Rwanda, Radio Rwanda	6055do	
0530	0600		Thailand, Radio Thailand	17655va	
0530	0600	mtwhf	UK, Sudan Radio Service	9525af	13720af

### 0600 UTC - 2AM EDT / 1AM CDT / 11PM PDT

0600	0600		USA, WHRI Cypress Creek SC		7315am
			7365am		
0600	0615	Sat/Sun	South Africa, Trans World Radio		11640af
0600	0630	mtwhf	France, Radio France International		11725af
			15160af	17800af	17800af
0600	0630		Germany, Deutsche Welle	7310af	15275af
0600	0630		Nigeria, Radio, National Svc/Abuja		7275do
0600	0645	mtwhf	South Africa, Trans World Radio		11640af
0600	0655		South Africa, Channel Africa	7230af	15255af
0600	0657		China, China Radio International		11710af
			11870me	11880as	13660as
			15350as	15465as	17505va
			17710as		17540as
0600	0658		New Zealand, Radio NZ International		9615pa
0600	0658	DRM	New Zealand, Radio NZ International		9890pa
0600	0700		Anguilla, Worldwide Univ Network		6090am
0600	0700		Australia, ABC NT Alice Springs		2310do
			4835do		
0600	0700		Australia, ABC NT Katherine	5025do	
0600	0700		Australia, ABC NT Tennant Creek		4910do
0600	0700		Australia, CVC International	15335as	
0600	0700	Sat/Sun	Australia, Radio Australia	15415as	
0600	0700		Australia, Radio Australia	9660as	12080as
			13630as	13690as	15160as
			15415as	15515pa	17750va
0600	0700		Canada, CFVP Calgary AB	6030na	
0600	0700		Canada, CKZN St John's NF	6160na	
0600	0700		Canada, CKZU Vancouver BC		6160na
0600	0700		Costa Rica, Worldwide Univ Network		5030va
			6150va	7375va	9725va
0600	0700		Cuba, Radio Havana Cuba	6000na	6060va
			6180na	9550na	11760na
0600	0700		Guyana, Voice of Guyana	3291do	
0600	0700		Malaysia, RTM/Traxx FM	7295as	
0600	0700		Malaysia, RTM/Voice of Malaysia		6175as

0600	0700		9750as	15295as		
0600	0700	vl	Nigeria, Radio Nigeria/Kaduna	4770do		
0600	0700		Papua New Guinea, Wantok R. Light	7325va		
0600	0700		Russia, Voice of Russia	17635pa	21790pa	
0600	0700		Singapore, MediaCorp Radio	6150do		
0600	0700		Swaziland, Trans World Radio	4775af		
			6120af	9500af		
0600	0700		UK, BBC World Service	6005af	6190af	
			6195va	9860af	11765af	12095as
			13820af	15310as	15400af	17640af
			17790as			
0600	0700	Sat/Sun	UK, BBC World Service	15420af		
0600	0700	DRM	UK, BBC World Service	6195af		
0600	0700		USA, American Forces Radio	4319usb	5446usb	
			5765usb	6350usb	7811usb	10320usb
			12133usb	13362usb		
0600	0700	mtwhf	USA, KWHR Naalehu HI	13650as		
0600	0700		USA, Voice of America	6080af	12080af	
			15580af			
0600	0700		USA, WBCQ Monticello ME	5110am		
0600	0700		USA, WBOH Newport NC	5920am		
0600	0700		USA, WEWN Vandiver AL	7570eu		
0600	0700		USA, WHRA Greenbush ME	7490va		
0600	0700		USA, WRMI Miami FL	9955am		
0600	0700		USA, WTJC Newport NC	9370na		
0600	0700		USA, WWCN Nashville TN	3215na	5070na	
			7465na	5935na		
0600	0700		USA, WWRB Manchester TN	3185va		
0600	0700		USA, WYFR/Family Radio Worldwide	5850na		
			7520va	9680na	11530af	11580va
0600	0700		Uzbekistan, CVC International	15515as		
0600	0700	vl	Vanuatu, Radio Vanatu	7260do		
0600	0700		Zambia, CVC Intl/Christian Voice	6065af		
			13590af			
0630	0644	mtwhfa	Vatican City, Vatican Radio	5965eu	7250eu	
			9645eu	11740eu	15595eu	
0630	0700		Bulgaria, Radio Bulgaria	7200na	9400eu	
0630	0700		Vatican City, Vatican Radio	11625af	13765af	
			15570af			
0645	0700	Sun	Germany, Trans World Radio Europe	6105eu		
0645	0700	Sun	Monaco, Trans World Radio Europe	9800eu		
0659	0700		New Zealand, Radio NZ International	7145pa		
0659	0700	DRM	New Zealand, Radio NZ International	6170pa		

### 0700 UTC - 3AM EDT / 2AM CDT / 12AM PDT

0700	0703	vl	Croatia, Croatian Radio	11690pa		
0700	0706		UK, BBC World Service	6005af		
0700	0727		Czech Rep, Radio Prague	9880eu	11600eu	
0700	0727		Slovakia, R Slovakia International	9440pa		
			11650pa			
0700	0730		France, Radio France International	13675af		
0700	0730	mtwhf	UK, BBC World Service	15575as		
0700	0745		USA, WYFR/Family Radio Worldwide	7520va		
0700	0750	mtwhf	Germany, Trans World Radio Europe	6105eu		
0700	0750	mtwhf	Monaco, Trans World Radio Europe	9800eu		
0700	0757		China, China Radio International	11880as		
			13660as	13710eu	15350as	15465as
			17490eu	17540as	17710as	
0700	0800		Anguilla, Worldwide Univ Network	6090am		
0700	0800		Australia, ABC NT Alice Springs	2310do		
			4835do			
0700	0800		Australia, ABC NT Katherine	5025do		
0700	0800		Australia, ABC NT Tennant Creek	4910do		
0700	0800		Australia, CVC International	15335as		
0700	0800		Australia, Radio Australia	9475as	9660as	
			9710as	13630pa	15160as	15240pa
			15415as	17750va		
0700	0800		Bhutan, Bhutan Broadcasting Svc	6035as		
0700	0800		Canada, CFVP Calgary AB	6030na		
0700	0800		Canada, CKZN St John's NF	6160na		
0700	0800		Canada, CKZU Vancouver BC	6160na		
0700	0800		Costa Rica, Worldwide Univ Network	5030va		
			6150va	7375va	9725va	11870va
0700	0800	Sun	Germany, Trans World Radio Europe	6105eu		
0700	0800		Guyana, Voice of Guyana	3291do	5950do	
0700	0800	Sat	Latvia, Radio SWH	9290eu		
0700	0800		Liberia, Star Radio	9525af		
0700	0800		Malaysia, RTM/Traxx FM	7295as		
0700	0800		Malaysia, RTM/Voice of Malaysia	6175as		
			9750as	15295as		
0700	0800	Sun	Monaco, Trans World Radio Europe	9800eu		
0700	0800		Myanmar, Myanmar Radio	9730do		
0700	0800		New Zealand, Radio NZ International	7145pa		
0700	0800	DRM	New Zealand, Radio NZ International	6170pa		
0700	0800		Nigeria, Radio Nigeria/Kaduna	4770do		
0700	0800	vl	Papua New Guinea, Wantok R. Light	7325va		
0700	0800		Russia, Voice of Russia	17495af	17635af	
0700	0800		Singapore, MediaCorp Radio	6150do		

0700	0800	vl	Solomon Islands, SIBC	5020do		
0700	0800		South Africa, Channel Africa	7230af		
0700	0800		Swaziland, Trans World Radio	4775af		
			6120af	9500af		
0700	0800		Taiwan, R Taiwan International	5950na		
0700	0800	Sat/Sun	UK, BBC World Service	15400af	15420af	
			15575as			
0700	0800		UK, BBC World Service	6190af	9860af	
			11760me	13820af	15310as	17790as
			17830af			
0700	0800	mtwhf	UK, BBC World Service	15400af		
0700	0800	Sat/Sun	UK, Bible Voice BC	5945eu		
0700	0800		USA, American Forces Radio	4319usb	5446usb	
			5765usb	6350usb	7811usb	10320usb
			12133usb	13362usb		
0700	0800	mtwhf	USA, KWHR Naalehu HI	13650as		
0700	0800		USA, WBCQ Monticello ME	5110am		
0700	0800		USA, WBOH Newport NC	5920am		
0700	0800		USA, WEWN Vandiver AL	7570eu		
0700	0800		USA, WHRI Cypress Creek SC	7315am		
0700	0800		USA, WHRI Cypress Creek SC	5875va		
			7315am			
0700	0800		USA, WRMI Miami FL	9955am		
0700	0800		USA, WTJC Newport NC	9370na		
0700	0800		USA, WWCN Nashville TN	3215na	5070na	
			7465na	5935na		
0700	0800		USA, WWRB Manchester TN	3185va		
0700	0800		USA, WYFR/Family Radio Worldwide	5985na		
			6915na	9505na	9715na	9930af
0700	0800		Uzbekistan, CVC International	15515as		
0700	0800	vl	Vanuatu, Radio Vanatu	7260do		
0700	0800		Zambia, CVC Intl/Christian Voice	6065af		
			13590af			
0715	0750	Sat	Germany, Trans World Radio Europe	6105eu		
0715	0750	Sat	Monaco, Trans World Radio Europe	9800eu		
0745	0800	f	UK, Bible Voice BC	5945eu		

### 0800 UTC - 4AM EDT / 3AM CDT / 1AM PDT

0800	0815	Sat	Guam, KTWR/Trans World Radio	11840pa		
0800	0815	Sat/Sun	UK, Bible Voice BC	5945eu		
0800	0820	Sun	Germany, Trans World Radio Europe	6105eu		
0800	0820	Sun	Monaco, Trans World Radio Europe	9800eu		
0800	0825		Malaysia, RTM/Voice of Malaysia	6175as		
			9750as	15295as		
0800	0830		Australia, ABC NT Katherine	5025do		
0800	0830		Australia, ABC NT Tennant Creek	4910do		
0800	0830	mtwhf	Myanmar, Myanmar Radio	9730do		
0800	0835		Guam, KTWR/Trans World Radio	11840pa		
0800	0845		USA, WYFR/Family Radio Worldwide	5950ca		
			9930af			
0800	0857		China, China Radio International	11620as		
			11880as	13710eu	15350as	15465as
			17490eu	17540as		
0800	0900		Anguilla, Worldwide Univ Network	6090am		
0800	0900		Australia, ABC NT Alice Springs	2310do		
			4835do			
0800	0900		Australia, CVC International	15335as		
0800	0900		Australia, Radio Australia	9475as	9580va	
			9590va	9710as	12080pa	13630as
			15415as	17750va		
0800	0900		Bhutan, Bhutan Broadcasting Svc	6035as		
0800	0900		Canada, CFVP Calgary AB	6030na		
0800	0900		Canada, CKZN St John's NF	6160na		
0800	0900		Canada, CKZU Vancouver BC	6160na		
0800	0900		Costa Rica, Worldwide Univ Network	5030va		
			6150va	7375va	9725va	11870va
0800	0900	DRM	Germany, Deutsche Welle	12005as		
0800	0900		Guyana, Voice of Guyana	3291do	5950do	
0800	0900		Indonesia, Voice of Indonesia	9525al	11785pa	
			15150as			
0800	0900		Malaysia, RTM/Traxx FM	7295as		
0800	0900		New Zealand, Radio NZ International	7145pa		
0800	0900	DRM	New Zealand, Radio NZ International	6170pa		
0800	0900		Nigeria, Radio Nigeria/Kaduna	4770do		
0800	0900		Nigeria, Voice of Nigeria/Lagos	9690af		
0800	0900		Papua New Guinea, National BC	4890do		
0800	0900	vl	Papua New Guinea, Wantok R. Light	7325va		
0800	0900		Russia, Voice of Russia	17495af	17635af	
0800	0900	DRM	Russia, Voice of Russia	12060eu	15545eu	
0800	0900		Singapore, MediaCorp Radio	6150do		
0800	0900	vl	Solomon Islands, SIBC	5020do		
0800	0900		South Africa, Channel Africa	9625af		
0800	0900	Sun	South Africa, SA Radio League	7205af		
			17570af			
0800	0900		South Korea, KBS World Radio	9570as		
0800	0900		Swaziland, Trans World Radio	4775af		
			6120af	9500af		
0800	0900		UK, BBC World Service	6190af	9860af	



			11760me	15310as	15400af	17640as
			17790af	17830af	21470af	
0800	0900	Sat/Sun	UK, BBC World Service	15575as		
0800	0900		USA, American Forces Radio	4319usb	5446usb	
			5765usb	6350usb	7811usb	10320usb
			12133usb	13362usb		
0800	0900		USA, KNLS Anchor Point AK	7355as		
0800	0900		USA, WBCQ Monticello ME	5110am		
0800	0900		USA, WBOH Newport NC	5920am		
0800	0900		USA, WEWN Vandiver AL	9355as		
0800	0900		USA, WHRI Cypress Creek SC		7315am	
0800	0900	mtwhf	USA, WHRI Cypress Creek SC		11565va	
0800	0900	Sat/Sun	USA, WHRI Cypress Creek SC		5875va	
0800	0900		USA, WRMI Miami FL	9955am		
0800	0900		USA, WTJC Newport NC	9370na		
0800	0900		USA, WWCR Nashville TN	3215na	5070na	
			7465na	5935na		
0800	0900		USA, WWRB Manchester TN	3185va		
0800	0900		USA, WYFR/Family Radio Worldwide		5985na	
			6915na			
0800	0900		Uzbekistan, CVC International		15515as	
0800	0900	vl	Vanuatu, Radio Vanatu	7260do		
0800	0900		Zambia, CVC Intl/Christian Voice		6065af	
			13590af			
0805	0900	ff	Guam, KTW/Trans World Radio		15170as	
0820	0900	w	Guam, KTW/Trans World Radio		15170as	
0830	0900		Australia, ABC NT Katherine	2485do		
0830	0900		Australia, ABC NT Tennant Creek		2325do	
0830	0900	m	Guam, KTW/Trans World Radio		15170as	
0830	0900		Lithuania, Radio Vilnius	9710na		

# 0900 UTC - 5AM EDT / 4AM CDT / 2AM PDT

0900	0926		Czech Rep, Radio Prague	9880eu	9955am	
			21745as			
0900	0930		Japan, NHK World/Radio Japan		9625as	
			9825pa	11815as	15590as	
0900	0957		China, China Radio International		11620as	
			15210pa	15270eu	15350as	17490eu
			17570eu	17690pa	17750as	
0900	1000		Anguilla, Worldwide Univ Network		6090am	
0900	1000		Australia, ABC NT Alice Springs		2310do	
			4835do			
0900	1000		Australia, ABC NT Katherine	2485do		
0900	1000		Australia, ABC NT Tennant Creek		2325do	
0900	1000		Australia, CVC International	15230as		
0900	1000		Australia, Radio Australia	9475va	9580va	
			9590va	9710as	11880as	11945pa
			12080as	15415as		
0900	1000		Bhutan, Bhutan Broadcasting Svc		6035as	
0900	1000		Canada, CFVP Calgary AB	6030na		
0900	1000		Canada, CKZN St John's NF	6160na		
0900	1000		Canada, CKZU Vancouver BC		6160na	
0900	1000		Costa Rica, Worldwide Univ Network		5030va	
			6150va	7375va	9725va	11870va
			13750va			
0900	1000		Germany, Deutsche Welle	15340as	17705as	
0900	1000		Guyana, Voice of Guyana	3291do	5950do	
0900	1000		Malaysia, RTM/Traxx FM	7295as		
0900	1000		New Zealand, Radio NZ International		7145pa	
0900	1000	DRM	New Zealand, Radio NZ International		6170pa	
0900	1000		Nigeria, Radio Nigeria/Kaduna		4770do	
0900	1000		Nigeria, Voice of Nigeria/Lagos		9690af	
0900	1000		Papua New Guinea, National BC		4890do	
0900	1000	vl	Papua New Guinea, Wantok R. Light		7325va	
0900	1000		Saudi Arabia, BSKSA	15250af		
0900	1000		Singapore, MediaCorp Radio	6150do		
0900	1000	vl	Solomon Islands, SIBC	5020do		
0900	1000		South Africa, Channel Africa	9625af		
0900	1000		UK, BBC World Service	6190af	6195as	
			9740as	9860af	11760me	15310as
			15400af	15575as	17640af	17760as
			17790as	17830af	21470af	21660as
0900	1000		Ukraine, R Ukraine International		11550eu	
0900	1000		USA, American Forces Radio	4319usb	5446usb	
			5765usb	6350usb	7811usb	10320usb
			12133usb	13362usb		
0900	1000		USA, WBCQ Monticello ME		5110am	
0900	1000		USA, WBOH Newport NC		5920am	
0900	1000		USA, WEWN Vandiver AL		9355as	
0900	1000		USA, WHRI Cypress Creek SC		5875na	
			7315am			
0900	1000		USA, WRMI Miami FL		9955am	
0900	1000		USA, WTJC Newport NC		9370na	
0900	1000		USA, WWCR Nashville TN		5070na	5890na
			5935na	9985na		
0900	1000		USA, WWRB Manchester TN		3185va	
0900	1000		USA, WYFR/Family Radio Worldwide		5985na	
			6915na	9465as	9755ca	

0900	1000	vl	Vanuatu, Radio Vanatu	7260do	
0900	1000		Zambia, CVC Intl/Christian Voice		6065af
			13590af		
0905	1000	Sun	Greece, Voice of Greece	9420eu	15605eu
0930	1000	Sun	Italy, IRRS	9510va	
0930	1000	Sun	Slovakia, European Gospel Radio		9510af

# 1000 UTC - 6AM EDT / 5AM CDT / 3AM PDT

1000	1030		Mongolia, Voice of Mongolia	12085as	
1000	1030		Vietnam, Voice of Vietnam	9840as	12020as
1000	1057		China, China Radio International		6040na
			11610as	11635as	13590as
			13720as	15190as	15210pa
			15390as	17490eu	17690pa
1000	1057		Netherlands, Radio Netherlands		5955eu
			11895as	12065as	13820as
1000	1058		New Zealand, Radio NZ International		7145pa
1000	1100		Anguilla, Worldwide Univ Network		11775am
1000	1100		Australia, ABC NT Alice Springs		2310do
			4835do		
1000	1100		Australia, ABC NT Katherine	2485do	
1000	1100		Australia, ABC NT Tennant Creek		2325do
1000	1100		Australia, CVC International	15230as	
1000	1100		Australia, Radio Australia	9580as	9590va
			9710as	11880as	11945pa
			15415as		
1000	1100		Canada, CFVP Calgary AB	6030na	
1000	1100		Canada, CKZN St John's NF	6160na	
1000	1100		Canada, CKZU Vancouver BC		6160na
1000	1100		Costa Rica, Worldwide Univ Network		5030va
			6150va	7375va	9725va
			13750va		
1000	1100		Guyana, Voice of Guyana	3291do	5950do
1000	1100		India, All India Radio	7270as	13695pa
			15020as	15260as	15410as
			17800as	17895pa	
1000	1100	Sun	Italy, IRRS	9510va	
1000	1100		Malaysia, RTM/Traxx FM	7295as	
1000	1100	DRM	New Zealand, Radio NZ International		6170pa
1000	1100		Nigeria, Radio Nigeria/Kaduna		4770do
1000	1100		Nigeria, Voice of Nigeria/Lagos		9690af
1000	1100		North Korea, Voice of Korea	11710am	11735as
			13650as	15180am	
1000	1100		Papua New Guinea, National BC		4890do
1000	1100	vl	Papua New Guinea, Wantok R. Light		7325va
1000	1100		Saudi Arabia, BSKSA	15250af	
1000	1100		Singapore, MediaCorp Radio	6150do	
1000	1100	Sun	Slovakia, European Gospel Radio		9510af
1000	1100	vl	Solomon Islands, SIBC	5020do	
1000	1100		South Africa, Channel Africa	9625af	
1000	1100		UK, BBC World Service	6195as	9740as
			11760me	15575as	17640af
			17790as	21470af	21660as
1000	1100	Sat/Sun	UK, BBC World Service	15400af	17830af
1000	1100		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb
			12133usb	13362usb	
1000	1100		USA, KNLS Anchor Point AK		6890as
1000	1100		USA, WBOH Newport NC		5920am
1000	1100		USA, WEWN Vandiver AL		9355as
			USA, WHRI Cypress Creek SC		7315am
			9425am		
1000	1100		USA, WINB Red Lion PA		9265am
1000	1100		USA, WRMI Miami FL		9955am
1000	1100		USA, WTJC Newport NC		9370na
1000	1100		USA, WWCR Nashville TN		5070na
			5935na	15825na	5890na
1000	1100		USA, WWRB Manchester TN		3185va
1000	1100		USA, WYFR/Family Radio Worldwide		5940na
			5985na	6915na	9465as
			9755ca		
1000	1100		Zambia, CVC Intl/Christian Voice		6065af
			13590af		
1015	1045	Sun	UK, Bible Voice BC	5985as	
1030	1057		Czech Rep, Radio Prague	9880eu	11665eu
1030	1100		Guam, KSDA/ Adventist World Radio		11780as
1030	1100		Iran, Voice of the Islamic Rep of Iran		15600as
			17600as		
1059	1100		New Zealand, Radio NZ International		9655pa

# 1100 UTC - 7AM EDT / 6AM CDT / 4AM PDT

1100	1130		Iran, Voice of the Islamic Rep of Iran	15600as	
			17600as		
1100	1130		UK, BBC World Service	15400af	
1100	1130		Vietnam, Voice of Vietnam	7285as	
1100	1145		USA, WYFR/Family Radio Worldwide		9550sa
			9755ca		
1100	1157		China, China Radio International		5955as

			6040na	11650as	11660as	11750as
			11795as	13590as	13620eu	13720as
			13645as	17490eu		
1100	1158	DRM	New Zealand, Radio NZ International			
1100	1200		Anguilla, Worldwide Univ Network			
1100	1200		Australia, ABC NT Alice Springs			
			4835do			
1100	1200		Australia, ABC NT Katherine			
1100	1200		Australia, ABC NT Tennant Creek			
1100	1200		Australia, CVC International			
1100	1200		Australia, Radio Australia			
			9475as	9560as	9590va	11880as
			11945pa	12080as		
1100	1200	Sat/Sun	Canada, CBC NQ SW Service			
1100	1200		Canada, CFVP Calgary AB			
1100	1200		Canada, CKZN St John's NF			
1100	1200		Canada, CKZU Vancouver BC			
1100	1200		Costa Rica, Worldwide Univ Network			
			6150va	7375va	9725va	11870va
			13750va			
1100	1200	Sun	Italy, IRRS			
1100	1200		Malaysia, RTM/Traxx FM			
1100	1200		New Zealand, Radio NZ International			
1100	1200		Nigeria, Radio Nigeria/Kaduna			
1100	1200		Nigeria, Voice of Nigeria/Lagos			
1100	1200		Papua New Guinea, National BC			
1100	1200	vl	Papua New Guinea, Wantok R. Light			
1100	1200		Saudi Arabia, BSKSA			
1100	1200		Singapore, R Singapore International			
			6150as			
1100	1200	Sun	Slovakia, European Gospel Radio			
1100	1200	vl	Solomon Islands, SIBC			
1100	1200		South Africa, Channel Africa			
1100	1200		Taiwan, R Taiwan International			
1100	1200		UK, BBC World Service			
			9740as	9860af	11760me	15310as
			15340as	15575as	17640af	17760as
			17790as	17830af	21470af	
1100	1200		Ukraine, R Ukraine International			
1100	1200		USA, American Forces Radio			
			5765usb	6350usb	7811usb	10320usb
			12133usb	13362usb		
			USA, WBOH Newport NC			
			USA, WEWN Vandiver AL			
1100	1200		USA, WHRI Cypress Creek SC			
			9425am			
1100	1200		USA, WINB Red Lion PA			
1100	1200		USA, WRMI Miami FL			
1100	1200		USA, WTJC Newport NC			
1100	1200		USA, WWCN Nashville TN			
			9980na	15825na		
1100	1200		USA, WWRB Manchester TN			
1100	1200		USA, WYFR/Family Radio Worldwide			
			5985na	7780sa	9625sa	
1100	1200		Zambia, CVC Intl/Christian Voice			
			13590af			
1115	1130		UK, Bible Voice BC			
1130	1200		Bulgaria, Radio Bulgaria			
1130	1200		Guam, KSDA/ Adventist World Radio			
1130	1200		Vatican City, Vatican Radio			
1157	1200		Netherlands, Radio Netherlands			

## 1200 UTC - 8AM EDT / 7AM CDT / 5AM PDT

1200	1230		Australia, HCJB Global			
1200	1230		France, Radio France International			
1200	1230		Germany, Adventist World Radio Europe			
1200	1230		Japan, NHK World/Radio Japan			
			9625as	9695as	17585eu	
1200	1230		Saudi Arabia, BSKSA			
1200	1245		USA, WYFR/Family Radio Worldwide			
			5985na			
1200	1256		Romania, R Romania International			
			15220eu			
1200	1257		China, China Radio International			
			9460as	9600as	9645as	9730as
			9760pa	11650as	11660as	11760pa
			11980as	13645as	13650eu	13790eu
			17490eu			
1200	1258		New Zealand, Radio NZ International			
1200	1259		Netherlands, Radio Netherlands			
1200	1259		Poland, Polish Radio			
1200	1300		Anguilla, Worldwide Univ Network			
1200	1300		Australia, ABC NT Alice Springs			
			4835do			
1200	1300		Australia, ABC NT Katherine			
1200	1300		Australia, ABC NT Tennant Creek			
1200	1300		Australia, CVC International			
1200	1300		Australia, Radio Australia			

			9560pa	9580va	9590va	11880as
			11945pa			
1200	1300	DRM	Australia, Radio Australia			
1200	1300	Sat/Sun	Canada, CBC NQ SW Service			
1200	1300		Canada, CFVP Calgary AB			
1200	1300		Canada, CKZN St John's NF			
1200	1300		Canada, CKZU Vancouver BC			
1200	1300		Costa Rica, Worldwide Univ Network			
			11870va	13750va		
1200	1300	Sun	Latvia, Radio SWH			
1200	1300		Malaysia, RTM/Traxx FM			
1200	1300		Nigeria, Radio Nigeria/Kaduna			
1200	1300		Nigeria, Voice of Nigeria/Lagos			
1200	1300		Papua New Guinea, National BC			
1200	1300	vl	Papua New Guinea, Wantok R. Light			
1200	1300		Singapore, R Singapore International			
			6150as			
1200	1300	vl	Solomon Islands, SIBC			
1200	1300		South Korea, KBS World Radio			
1200	1300	Fri/ DRM	Taiwan, R Taiwan International			
1200	1300		UK, BBC World Service			
			9740as	9860af	11750as	11760me
			15310as	15575as	17640af	17790as
			17830af	21470af		
1200	1300		USA, American Forces Radio			
			5765usb	6350usb	7811usb	10320usb
			12133usb	13362usb		
1200	1300		USA, KNLS Anchor Point AK			
1200	1300	Sun	USA, KWHR Naalehu HI			
1200	1300		USA, Voice of America			
			9645va	9760va	12075va	
1200	1300		USA, WBOH Newport NC			
1200	1300		USA, WEWN Vandiver AL			
1200	1300		USA, WHRA Greenbush ME			
1200	1300	Sat/Sun	USA, WHRI Cypress Creek SC			
1200	1300		USA, WHRI Cypress Creek SC			
1200	1300		USA, WINB Red Lion PA			
1200	1300		USA, WRMI Miami FL			
1200	1300		USA, WTJC Newport NC			
1200	1300		USA, WWCN Nashville TN			
			13845na	15825na		
1200	1300		USA, WWRB Manchester TN			
1200	1300		USA, WYFR/Family Radio Worldwide			
			11560as	17555sa	17795ca	
1200	1300		Zambia, CVC Intl/Christian Voice			
			13590af			
1215	1300		Egypt, Radio Cairo			
1228	1300	vl	Vatican City, Vatican Radio			
1230	1300	mtwhfa	Australia, HCJB Global			
1230	1300		Bangladesh, Bangla Betar			
1230	1300		Sweden, Radio Sweden			
1230	1300		Thailand, Radio Thailand			
1230	1300		Turkey, Voice of Turkey			
1230	1300		Vietnam, Voice of Vietnam			
1245	1300	Sat	UK, Bible Voice BC			

## 1300 UTC - 9AM EDT / 8AM CDT / 6AM PDT

1300	1325		Turkey, Voice of Turkey			
1300	1329		Czech Rep, Radio Prague			
1300	1330	mtwhfa	Australia, HCJB Global			
1300	1330		Egypt, Radio Cairo			
1300	1330		Serbia, International Radio Serbia			
1300	1330	Sun	Slovakia, Universal Life			
1300	1357		China, China Radio International			
			9570na	9650na	9730as	9760pa
			9765as	9870as	11660as	11760
			p[a	11980as	13610eu	13750as
			15260na	15440as		
1300	1400		Anguilla, Worldwide Univ Network			
1300	1400		Australia, CVC International			
1300	1400		Australia, Radio Australia			
			9580va	9590va		
1300	1400	DRM	Australia, Radio Australia			
1300	1400	Sat/Sun	Canada, CBC NQ SW Service			
1300	1400		Canada, CFVP Calgary AB			
1300	1400		Canada, CKZN St John's NF			
1300	1400		Canada, CKZU Vancouver BC			
1300	1400		Costa Rica, Worldwide Univ Network			
			11870va	13750va		
1300	1400		Malaysia, RTM/Traxx FM			
1300	1400		New Zealand, Radio NZ International			
1300	1400		Nigeria, Radio Nigeria/Kaduna			
1300	1400		Nigeria, Voice of Nigeria/Lagos			
1300	1400		North Korea, Voice of Korea			
			11710na	13760eu	15245eu	
1300	1400		Papua New Guinea, National BC			
1300	1400	vl	Papua New Guinea, Wantok R. Light			
1300	1400		Singapore, R Singapore International			



1300	1400	vl	6150as Solomon Islands, SIBC	5020do	9545al
1300	1400		South Korea, KBS World Radio		9570na
1300	1400		7770as UK, BBC World Service	6190af	6195as
			9740as	9860af	11750as
			15310as	15420af	11760me
			17790as	21470af	15575as
1300	1400		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb
			12133usb	13362usb	10320usb
1300	1400	Sat/Sun	USA, KWHR Naalehu HI	12130as	
1300	1400		USA, Voice of America	9645va	9760va
1300	1400	Sun	USA, WBCQ Monticello ME	15420am	17495am
1300	1400		USA, WBOH Newport NC	5920am	
1300	1400		USA, WEWN Vandiver AL	11560as	
1300	1400		USA, WHRA Greenbush ME	15710va	
1300	1400	Sat/Sun	USA, WHRI Cypress Creek SC		9840na
1300	1400		USA, WINB Red Lion PA	13570am	
1300	1400		USA, WRMI Miami FL	9955am	
1300	1400		USA, WTJC Newport NC	9370na	
1300	1400		USA, WWCN Nashville TN	7465na	9980na
			13845na	15825na	
1300	1400		USA, WWRB Manchester TN	9285va	
1300	1400		USA, WYFR/Family Radio Worldwide		11560as
			11820na	11865na	11910na
			17715af	17795ca	17630af
1300	1400	vl	Vatican City, Vatican Radio	11850as	
1300	1400		Zambia, CVC Intl/Christian Voice		6065af
			13590af		
1305	1320	m	Austria, Radio Austria International		13730eu
1305	1330	Sat/Sun	Austria, Radio Austria International		13730eu
1310	1340		Japan, NHK World/Radio Japan		11985as
1330	1357	fa/ DRM	Czech Rep, Radio Prague	9850eu	
1330	1400	mt	Guam, KSDA/ Adventist World Radio		15275as
1330	1400	hfa	Guam, KSDA/ Adventist World Radio		15275as
1330	1400		India, All India Radio	9690as	11620as
			13710as		
1330	1400		Laos, National Radio	7145as	
1330	1400		USA, Voice of America	9465va	11725va
			15130va	15565va	
1330	1400		Vietnam, Voice of Vietnam	9840as	12020as
1335	1400	Sat/Sun	Austria, Radio Austria International		13730eu
1345	1400	hf	Austria, Radio Austria International		13730eu
1355	1400		Guam, KTW/Trans World Radio		9975as

# 1400 UTC - 10AM EDT / 9AM CDT / 7AM PDT

1400	1415	Sat	Germany, Pan American BC	15205me	
1400	1430	Sun	Australia, HCJB Global	15425as	
1400	1430		Australia, HCJB Global	15400as	
1400	1430	sw	Germany, Pan American BC	15205as	
1400	1430	mhf	Guam, KTW/Trans World Radio		9975as
1400	1430		Japan, NHK World/Radio Japan		11705va
			11985as	13630eu	21560eu
1400	1430		Thailand, Radio Thailand	9805va	
1400	1430	Sun	United Arab Emirates, FEBA	12025as	
1400	1457		China, China Radio International		5995as
			9765as	9870as	11675as
			13685af	13710eu	13740na
			17630af		13790eu
1400	1457		Czech Rep, Radio Prague	9955am	
1400	1500		Anguilla, Worldwide Univ Network		11775am
1400	1500		Australia, CVC International	13635as	
1400	1500		Australia, Radio Australia	5995va	6080va
			7240va	9590va	
1400	1500		Bhutan, Bhutan Broadcasting Svc		6035as
1400	1500	Sat/Sun	Canada, CBC NQ SW Service	9625na	
1400	1500		Canada, CFVP Calgary AB	6030na	
1400	1500		Canada, CKZN St John's NF	6160na	
1400	1500		Canada, CKZU Vancouver BC		6160na
1400	1500		Costa Rica, Worldwide Univ Network		9725va
			11870va	13750va	
1400	1500	DRM	Germany, CVC Intl/Voice Africa		7270eu
1400	1500		Germany, The Overcomer Ministries		6110eu
			13810va		
1400	1500	tw	Guam, KTW/Trans World Radio		9975as
1400	1500		India, All India Radio	9690as	11620as
			13710as		
1400	1500		Jordan, Radio Jordan	11690na	
1400	1500		Libya, Voice of Africa	17725af	21695af
1400	1500		Malaysia, RTM/Traxx FM	7295as	
1400	1500		Netherlands, Radio Netherlands		5830as
			9885as	11835as	
1400	1500		New Zealand, Radio NZ International		6170pa
1400	1500		Nigeria, Radio Nigeria/Kaduna	4770do	
1400	1500		Nigeria, Voice of Nigeria/Lagos		9690af
1400	1500		Oman, Radio Oman	15140as	
1400	1500	vl	Papua New Guinea, Wantok R. Light		7325va

1400	1500	DRM	Russia, Voice of Russia	9650eu	
1400	1500		Russia, Voice of Russia	7165as	7255as
			9625as	9660as	9745as
			15605as	15660as	
1400	1500		Singapore, MediaCorp Radio	6150do	
1400	1500	vl	Solomon Islands, SIBC	5020do	9545al
1400	1500		UK, BBC World Service	5980as	6190af
			6195as	9740as	11920as
			15310as	17640af	17830af
1400	1500	Sat/Sun	UK, Bible Voice BC		15680as
1400	1500		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb
			12133usb	13362usb	10320usb
1400	1500		USA, KJES Vado NM		11715na
1400	1500		USA, KNLS Anchor Point AK	7355as	
1400	1500		USA, Voice of America	4930af	6080af
			7125va	9345as	9760va
			15530va	15580af	17530af
1400	1500	Sun	USA, WBCQ Monticello ME	15420am	17495am
1400	1500		USA, WBCQ Monticello ME	9930am	
1400	1500		USA, WBOH Newport NC	5920am	
1400	1500		USA, WEWN Vandiver AL	15855as	
1400	1500		USA, WHRA Greenbush ME	15195va	
1400	1500	Sat/Sun	USA, WHRI Cypress Creek SC		9840na
			11785na		
1400	1500		USA, WINB Red Lion PA	13570am	
1400	1500		USA, WRMI Miami FL	9955na	
1400	1500		USA, WTJC Newport NC	9370na	
1400	1500		USA, WWCN Nashville TN	7465na	9980na
			13845na	15825na	
1400	1500		USA, WWRB Manchester TN	9385va	
1400	1500		USA, WYFR/Family Radio Worldwide		11560na
			11830na	11910na	13695na
			17715af	17795ca	17630af
1400	1500	vl	Vatican City, Vatican Radio	11850as	
1400	1500		Zambia, CVC Intl/Christian Voice		6065af
			13590af		
1415	1430	mtwhfa	Germany, Pan American BC	15205as	
1415	1430		Nepal, Radio Nepal	5005as	
1430	1445	Sun	Germany, Pan American BC	15205as	
1430	1459		Vatican City, Vatican Radio	4885eu	7250eu
			9645eu		
1430	1500	mtwhfa	Albania, Radio Tirana	13640na	
1430	1500		Australia, Radio Australia	9475va	11660pa
1430	1500		Ethiopia, Radio Ethiopia	5990af	7110af
			9704af		
1430	1500	f/ DRM	South Korea, KBS World Radio		9460eu
1430	1500		Sweden, Radio Sweden	13820va	15240na

# 1500 UTC - 11AM EDT / 10AM CDT / 8AM PDT

1500	1510	mtwhfa	Turkmenistan, Turkmen Radio	5015eu	
1500	1528		Vietnam, Voice of Vietnam	7285va	9840va
			12020va		
1500	1530		Guam, KSDA/ Adventist World Radio		11985as
1500	1530		Nigeria, Radio, National Svc/Abuja		7275do
1500	1530		UK, BBC World Service	7380af	11860af
			15420af		
1500	1530	Sat/Sun	UK, Sudan Radio Service	9840af	
1500	1530	vl	Venezuela, R Nacional de Venezuela		11680sa
1500	1545		USA, WYFR/Family Radio Worldwide		15770sa
1500	1550		New Zealand, Radio NZ International		6170pa
1500	1550	vl	Vatican City, Vatican Radio	11850as	
1500	1555		South Africa, Channel Africa	15215af	
1500	1557		Canada, R Canada International		11675as
			17720as		
1500	1557		China, China Radio International		5955as
			6100af	7160as	7325as
			9870as	11965eu	13640eu
			13740na	17630af	
1500	1557		Netherlands, Radio Netherlands		5830af
			9885as	11835as	
1500	1600		Anguilla, Worldwide Univ Network		11775am
1500	1600		Australia, CVC International	13635as	
1500	1600		Australia, Radio Australia	5995va	6080va
			7240as	9475va	9590as
1500	1600	Sat/Sun	Canada, CBC NQ SW Service	9625na	
1500	1600		Canada, CFVP Calgary AB	6030na	
1500	1600		Canada, CKZN St John's NF	6160na	
1500	1600		Canada, CKZU Vancouver BC		6160na
1500	1600		Costa Rica, Worldwide Univ Network		9725va
			11870va	13750va	
1500	1600		Finland, Overcomer Ministries		9595me
1500	1600	DRM	Germany, CVC Intl/Voice Africa		7270eu
1500	1600		Germany, The Overcomer Ministries		6110eu
			17485af		
1500	1600		Italy, IRRS	9825af	
1500	1600		Jordan, Radio Jordan		11690na
1500	1600		Libya, Voice of Africa	17725af	21695af

1500 1600	Malaysia, RTM/Traxx FM	7295as	
1500 1600	Myanmar, Myanma Radio	5985as	
1500 1600	Nigeria, Radio Nigeria/Kaduna	4770do	
1500 1600	Nigeria, Voice of Nigeria/Lagos	9690af	
1500 1600	North Korea, Voice of Korea	3560eu	9335na
	11710eu	13760eu	15245eu
1500 1600 vl	Papua New Guinea, Wantok R. Light	7325va	
1500 1600	Russia, Voice of Russia	4965va	9810eu
1500 1600	Singapore, MediaCorp Radio	6150do	
1500 1600 vl	Slovakia, Miraya FM Radio	9825af	
1500 1600 vl	Solomon Islands, SIBC	5020do	9545al
1500 1600	Uganda, Dunamis Shortwave	4750af	
1500 1600	UK, BBC World Service	5975as	5980as
	6190af	6195as	9740as
	11920as	12095va	15310as
	17640af	17830af	21470af
1500 1600 Sat/Sun	UK, BBC World Service	7380af	15420af
1500 1600	USA, American Forces Radio	4319usb	5446usb
	5765usb	6350usb	7811usb
	12133usb	13362usb	
1500 1600	USA, KJES Vado NM	11715na	
1500 1600	USA, Voice of America	6160va	7125va
	7480va	9345as	9695va
	9760va	12150va	13570af
	15530va	15550va	15580af
1500 1600 Sun	USA, WBCQ Monticello ME	15420am	17495am
1500 1600	USA, WBCQ Monticello ME	9330am	
1500 1600	USA, WBOH Newport NC	5920am	
1500 1600	USA, WEWN Vandiver AL	15855as	
1500 1600	USA, WHRA Greenbush ME	15195va	
1500 1600 Sat/Sun	USA, WHRI Cypress Creek SC		9840na
	11785na		
1500 1600	USA, WINB Red Lion PA	13570am	
1500 1600	USA, WRMI Miami FL	9955na	
1500 1600	USA, WTJC Newport NC	9370na	
1500 1600	USA, WWCN Nashville TN	7465na	9980na
	13845na	15825na	
1500 1600	USA, WWRB Manchester TN	9385va	
1500 1600	USA, WYFR/Family Radio Worldwide		6280as
	11830na	11910na	17795ca
1500 1600	Zambia, CVC Intl/Christian Voice		6065af
	13590af		
1505 1557	Canada, R Canada International		9515as
	17720as	11675as	
1515 1545 mtwhf	Swaziland, Trans World Radio		6065af
1515 1545 smtwhf	Swaziland, Trans World Radio		4760af
1530 1558	Vatican City, Vatican Radio		13765eu
1530 1600	Germany, Adventist World Radio Europe		15225as
1530 1600	Iran, Voice of the Islamic Rep of Iran		7375as
	9600as		
1530 1600	Mongolia, Voice of Mongolia		12085as
1530 1600	Sweden, Radio Sweden		11590va
1530 1600 Sun	UK, Bible Voice BC		13590me
1530 1600 ha	UK, Bible Voice BC		15680as
1530 1600 mtwhf	UK, Sudan Radio Service		9840af
1540 1600 mtwhf	UK, Bible Voice BC		13590me
1545 1600 Sat	UK, Bible Voice BC		13590me
1551 1600 DRM	New Zealand, Radio NZ International		6170pa
1551 1600	New Zealand, Radio NZ International		7145pa

### 1600 UTC - 12PM EDT / 11AM CDT / 9AM PDT

1600 1615	Pakistan, Radio Pakistan	9380va	11570va
	15625af		
1600 1615 twha	UK, Bible Voice BC		13590me
1600 1627	Czech Rep, Radio Prague	5930eu	17485af
1600 1627	Iran, Voice of the Islamic Rep of Iran		7375as
	9600as		
1600 1628	Vietnam, Voice of Vietnam	7220va	7280va
	9550va	9730va	
1600 1630	Guam, KSDA/ Adventist World Radio		11805as
	11985as		
1600 1630	Myanmar, Myanma Radio		9730do
1600 1630	Nigeria, Voice of Nigeria/Lagos		9690af
1600 1630 Sat/Sun	Swaziland, Trans World Radio		6065af
1600 1630	Yemen, Rep of Yemen Radio		9780me
1600 1645 Sun	Germany, Pan American BC		13830me
1600 1645	USA, WYFR/Family Radio Worldwide		11830na
	11865na		
1600 1657	Canada, R Canada International		9515as
1600 1657	China, China Radio International		6100af
	6180me	9570af	9760me
	11940eu	11965eu	13760eu
1600 1658	Germany, Deutsche Welle		6170as
	15640as		
1600 1659	Finland, Overcomer Ministries		9595me
1600 1700	Anguilla, World Network		11775am
1600 1700	Australia, CVC International		13635as
1600 1700	Australia, Radio Australia		5995va
			6080va

1600 1700 Sat	7240as	9475va	9710pa	11660pa
1600 1700	Canada, CBC NQ SW Service		9625na	
1600 1700	Canada, CFVP Calgary AB		6030na	
1600 1700	Canada, CKZN St John's NF		6160na	
1600 1700	Canada, CKZU Vancouver BC			6160na
1600 1700 DRM	Canada, R Canada International			9800na
1600 1700	Costa Rica, Worldwide Univ Network			11870va
	13750va			
1600 1700	Egypt, Radio Cairo		12170af	
1600 1700	Ethiopia, Radio Ethiopia		7165af	9560af
1600 1700	France, Radio France International			15605af
	17605af			
1600 1700	Italy, IRRS		9825af	
1600 1700	Malaysia, RTM/Traxx FM		7295as	
1600 1700 DRM	New Zealand, Radio NZ International			6170pa
1600 1700	New Zealand, Radio NZ International			7145pa
1600 1700	Nigeria, Radio Nigeria/Kaduna			4770do
1600 1700	North Korea, Voice of Korea		9990va	11545va
1600 1700 vl	Papua New Guinea, Wantok R. Light			7325va
1600 1700	Russia, Voice of Russia		4975me	6070as
	7350as	9405as	9890eu	11985va
	12055as	13855va		
1600 1700 vl	Rwanda, Radio Rwanda		6055do	
1600 1700 vl	Slovakia, Miraya FM Radio		9825af	
1600 1700 vl	Solomon Islands, SIBC		5020do	9545al
1600 1700	South Korea, KBS World Radio			9515eu
1600 1700	Taiwan, R Taiwan International			11550as
	15515as			
1600 1700	Uganda, Dunamis Shortwave		4750af	
1600 1700	UK, BBC World Service		3255af	5975as
	6190af	9625as	11920as	12095va
	15400af	15420af	17640af	17795af
	17830af	21470af		
1600 1700 Sat/Sun	UK, BBC World Service		7380af	
1600 1700 fs	UK, Bible Voice BC		13590me	
1600 1700	USA, American Forces Radio		4319usb	5446usb
	5765usb	6350usb	7811usb	10320usb
	12133usb	13362usb		
1600 1700	USA, Voice of America		4930af	6080af
	12080va	13600va	13615va	15455va
	15580af	17895va		
1600 1700 Sun	USA, WBCQ Monticello ME		15420am	17495am
1600 1700	USA, WBCQ Monticello ME		9330am	
1600 1700	USA, WBOH Newport NC		5920am	
1600 1700	USA, WEWN Vandiver AL		15855as	
1600 1700	USA, WHRA Greenbush ME		17520af	
1600 1700	USA, WHRI Cypress Creek SC			9495am
	9840na			
1600 1700	USA, WINB Red Lion PA		13570am	
1600 1700	USA, WRMI Miami FL		9955am	
1600 1700	USA, WTJC Newport NC		9370na	
1600 1700	USA, WWCN Nashville TN		9980na	12160na
	13845na	15825na		
1600 1700	USA, WWRB Manchester TN		9385va	12180va
1600 1700 Sun	USA, WWRB Manchester TN		11920af	
1600 1700	USA, WYFR/Family Radio Worldwide			6085ca
	13695na	17795ca	18980va	21525af
	21455va			
1600 1700	Zambia, CVC Intl/Christian Voice			4965af
	13590af			
1615 1629	Vatican City, Vatican Radio		5885eu	7250eu
	9645eu	15595eu		
1615 1630 h	UK, Bible Voice BC		13590me	
1615 1645 mtwhf	Swaziland, Trans World Radio			6130af
1615 1700 Sun	UK, BBC World Service		11860af	
1615 1700 ta	UK, Bible Voice BC		13590me	
1630 1645 h	UK, Bible Voice BC		13590me	
1630 1657	Slovakia, R Slovakia International			5920eu
	6055eu			
1630 1700	Guam, KSDA/ Adventist World Radio			6155as
1630 1700	Nigeria, Voice of Nigeria/Lagos			15120af
1630 1700 Sat/Sun	Swaziland, Trans World Radio			6130af
1630 1700 Sat	UK, BBC World Service		11860af	
1640 1650 mtwhfa	Turkmenistan, Turkmen Radio		4930eu	
1645 1700	Tajikistan, Tajik Radio		7245as	

### 1700 UTC - 1PM EDT / 12PM CDT / 10AM PDT

1700 1705	Canada, R Canada International		9515as
1700 1705 DRM	Canada, R Canada International		9800na
1700 1715 t/ vl	UK, Bible Voice BC		13590me
1700 1720 twhfa	Moldova, Radio PMR/Pridnestrovie		6235eu
1700 1727	Czech Rep, Radio Prague		5930eu
1700 1730	Jordan, Radio Jordan		11690na
1700 1730 DRM	Romania, R Romania International		7460eu
1700 1730 Sat	UK, Bible Voice BC		13590me
1700 1730	USA, Voice of America		6080af
	15580af		
1700 1730 Sat	USA, WRMI Miami FL		15650af



1700	1740	f	Moldova, Radio PMR/Pridnestrovie	6235eu	
1700	1745		UK, BBC World Service	6005af	9410af
1700	1755		South Africa, Channel Africa	15235af	
1700	1756		Romania, R Romania International	9535eu	
			11735eu		
1700	1757		China, China Radio International	6100af	
			6145eu 7130as 7265me 7315me		
			7335eu 9570af 9595eu 11900af		
			11940eu 13760eu		
1700	1757		Netherlands, Radio Netherlands	5955eu	
1700	1759		Poland, Polish Radio	7140eu	7265eu
1700	1800		Anguilla, Worldwide Univ Network	11775am	
1700	1800		Australia, CVC International	13635as	
1700	1800		Australia, Radio Australia	5995va	6080va
			9475as 9580va 9710as		11880as
1700	1800	Sat	Canada, CBC NQ SW Service	9625na	
1700	1800		Canada, CFVP Calgary AB	6030na	
1700	1800		Canada, CKZN St John's NF	6160na	
1700	1800		Canada, CKZU Vancouver BC	6160na	
1700	1800		Costa Rica, Worldwide Univ Network	11870va	
			13750va		
1700	1800		Egypt, Radio Cairo	12170af	
1700	1800		Equatorial Guinea, Radio Africa	15190af	
1700	1800		Equatorial Guinea, Radio Africa	15190af	
1700	1800		Italy, IRRS	9825af	
1700	1800		Malaysia, RTM/Traxx FM	7295as	
1700	1800	DRM	New Zealand, Radio NZ International	6170pa	
1700	1800		New Zealand, Radio NZ International	7145pa	
1700	1800		Nigeria, Radio Nigeria/Kaduna	4770do	
1700	1800		Nigeria, Voice of Nigeria/Lagos	15120af	
1700	1800	vl	Papua New Guinea, Wantok R. Light	7325va	
1700	1800	Sat	Russia, Voice of Russia	9820eu	9890eu
1700	1800		Russia, Voice of Russia	4975me	7350as
			9405as 11510af 11985af		
1700	1800	Sat/Sun	Russia, Voice of Russia	6000eu	7320eu
			7340eu		
1700	1800	vl	Rwanda, Radio Rwanda	6055do	
1700	1800	vl	Slovakia, Miraya FM Radio	9825af	
1700	1800	vl	Solomon Islands, SIBC	5020eu	9545al
1700	1800		Swaziland, Trans World Radio	3200af	
			9500af		
1700	1800		Taiwan, R Taiwan International	11705af	
			15690af		
1700	1800		Uganda, Dunamis Shortwave	4750af	
1700	1800		UK, BBC World Service	3255af	5975as
			6190af 6195va 7380af 9625as		
			11955as 12095af 13865va 15400af		
			17795af 17830af		
1700	1800	fas	UK, Bible Voice BC	9430me	13590me
1700	1800		USA, American Forces Radio	4319usb	5446usb
			5765usb 6350usb 7811usb		10320usb
			12133usb 13362usb		
1700	1800	Sat/Sun	USA, Voice of America	15675af	
1700	1800		USA, WBCQ Monticello ME	9330am	17495am
1700	1800		USA, WBOH Newport NC	5920am	
1700	1800		USA, WEWN Vandiver AL	15855as	
1700	1800		USA, WHRA Greenbush ME	17520af	
1700	1800		USA, WHRI Cypress Creek SC	9495am	
			9840na		
1700	1800		USA, WINB Red Lion PA	13570am	
1700	1800		USA, WRMI Miami FL	9955am	
1700	1800		USA, WTJC Newport NC	9370na	
1700	1800		USA, WWCR Nashville TN	9980na	12160na
			13845na 15825na		
1700	1800	Sun	USA, WWRB Manchester TN	11920af	
1700	1800		USA, WWRB Manchester TN	9385va	12180va
1700	1800		USA, WYFR/Family Radio Worldwide	13690na	
			17795ca 18980ca 21455va		
1700	1800		Zambia, CVC Intl/Christian Voice	4965af	
			13590af		
1720	1740	Sat/Sun	USA, Voice of America	4930af	13755af
			15775af		
1730	1757		Vatican City, Vatican Radio	11625af	12765af
			15570af		
1730	1800		Bulgaria, Radio Bulgaria	7200eu	9400eu
1730	1800		Guam, KSDA/ Adventist World Radio	9980as	
1730	1800		Swaziland, Trans World Radio	9500af	
1730	1800	whf	Sweden, Radio Sweden	6065va	
1730	1800	mtwhf	UK, Sudan Radio Service	9840af	
1730	1800		USA, Voice of America	5980va	5995va
			6080af 9570va 11805va		15410af
			15580af		
1730	1800	mtwhf	USA, Voice of America	4930af	13755af
			15775af		
1745	1800		Bangladesh, Bangla Betar	7250as	
1745	1800		India, All India Radio	7410eu	9445af
			9950eu 11620eu 11935af		13605af
			15075af 15155af 17670af		

## 1800 UTC - 2PM EDT / 1PM CDT / 11AM PDT

1800	1809		Tanzania, Tanzania Broadcasting Corp	11735af	
1800	1815	Sun	UK, Bible Voice BC	13590me	
1800	1815	Sat	UK, Bible Voice BC	11875me	
1800	1828		Vietnam, Voice of Vietnam	9765eu	
1800	1830	w	Austria, Adventist World Radio Europe	15315af	
1800	1830		Nigeria, Radio, National Svc/Abuja	7275do	
1800	1830		South Africa, AWR Africa	3215af	3345af
			9610af		
1800	1830		UK, BBC World Service	5975as	11955as
1800	1830	Sat	UK, Bible Voice BC	9430me	13590me
1800	1830	Sun	UK, Bible Voice BC	6130eu	
1800	1830		USA, Voice of America	6080af	15410af
			15580af 17865af		
1800	1830	Sat/Sun	USA, Voice of America	4930af	
1800	1845	Sat	UK, Bible Voice BC	6130eu	
1800	1850	DRM	New Zealand, Radio NZ International	6170pa	
1800	1850		New Zealand, Radio NZ International	7145pa	
1800	1857		China, China Radio International	7120eu	
			9600eu 13760eu		
1800	1857		Netherlands, Radio Netherlands	6020af	
			11660af 15535af		
1800	1859		Canada, R Canada International	9530af	
			11765af 17735af 17810af		
1800	1900		Anguilla, Worldwide Univ Network	11775am	
1800	1900	mtwhf	Argentina, RAE	9690am	15345am
1800	1900		Australia, Radio Australia	6080va	7240as
			9475va 9580as 9710as		11880as
1800	1900		Bangladesh, Bangla Betar	7250eu	
1800	1900		Canada, CFVP Calgary AB	6030na	
1800	1900		Canada, CKZN St John's NF	6160na	
1800	1900		Canada, CKZU Vancouver BC	6160na	
1800	1900		Costa Rica, Worldwide Univ Network	11870va	
			13750va		
1800	1900		Equatorial Guinea, Radio Africa	15190af	
1800	1900		Equatorial Guinea, Radio Africa	15190af	
1800	1900		India, All India Radio	7410eu	9445af
			9950eu 11620eu 11935af		13605af
			15075af 15155af 17670af		
1800	1900	fas	Italy, IRRS	7290va	
1800	1900		Kuwait, Radio Kuwait	11990na	
1800	1900		Malaysia, RTM/Traxx FM	7295as	
1800	1900		Netherlands, Radio Netherlands	7395af	
1800	1900		Nigeria, Radio Nigeria/Kaduna	4770do	
1800	1900		Nigeria, Voice of Nigeria/Lagos	15120af	
1800	1900		North Korea, Voice of Korea	3560eu	13760eu
1800	1900	vl	Papua New Guinea, Wantok R. Light	7325va	
1800	1900		Russia, Voice of Russia	9480eu	9745af
			9850af 9890eu		
1800	1900	vl	Rwanda, Radio Rwanda	6055do	
1800	1900	fas	Slovakia, European Gospel Radio	7290af	
1800	1900	vl	Solomon Islands, SIBC	5020do	9545al
1800	1900		South Korea, KBS World Radio	7275eu	
1800	1900		Swaziland, Trans World Radio	3200af	
			9500af		
1800	1900		Taiwan, R Taiwan International	3965eu	
1800	1900		Uganda, Dunamis Shortwave	4750af	
1800	1900		UK, BBC World Service	3255af	5895va
			5995as 6190af 6195va		7380af
			9485as 12095af 13865va		15400af
			17795af 17830af		
1800	1900	Sun	UK, Bible Voice BC	9430me	
1800	1900		USA, American Forces Radio	4319usb	5446usb
			5765usb 6350usb 7811usb		10320usb
			12133usb 13362usb		
1800	1900		USA, WBCQ Monticello ME	7415am	9330am
			17495am		
1800	1900		USA, WBOH Newport NC	5920am	
1800	1900		USA, WEWN Vandiver AL	15855as	
1800	1900		USA, WHRA Greenbush ME	17690af	
1800	1900	mtwhf	USA, WHRI Cypress Creek SC	17520af	
1800	1900	Sat/Sun	USA, WHRI Cypress Creek SC	9495am	
1800	1900		USA, WHRI Cypress Creek SC	9840na	
1800	1900		USA, WINB Red Lion PA	13570am	
1800	1900		USA, WRMI Miami FL	9955am	
1800	1900		USA, WTJC Newport NC	9370na	
1800	1900		USA, WWCR Nashville TN	9980na	12160na
			13845na 15825na		
1800	1900	Sun	USA, WWRB Manchester TN	11920af	
1800	1900		USA, WWRB Manchester TN	9385va	12180va
1800	1900		USA, WYFR/Family Radio Worldwide	13615na	
			13690na 17795ca 17845af		18980va
1800	1900		Yemen, Rep of Yemen Radio	9780me	
1800	1900		Zambia, CVC Intl/Christian Voice	4965af	
			13590af		
1830	1857		Slovakia, R Slovakia International	5920eu	
			6055eu		
1830	1900		Serbia, International Radio Serbia	6100eu	
			7200eu		

1830	1900	Turkey, Voice of Turkey	9785eu	
1830	1900	UK, BBC World Service	6005af	9410af
1830	1900	f UK, Bible Voice BC	9430me	
1830	1900	UK, Bible Voice BC	6130eu	
1830	1900	Sun USA, Voice of America	4930af	6080af
		9820va	9520va	9885af
		11805va	15410af	11755va
				15580af
1845	1900	mtwhfa Albania, Radio Tirana	7430eu	13640eu
1845	1900	Sun UK, Bible Voice BC	11830af	
1851	1900	DRM New Zealand, Radio NZ International	9890pa	
1851	1900	New Zealand, Radio NZ International	9615pa	

### 1900 UTC - 3PM EDT / 2PM CDT / 12PM PDT

1900	1925	Turkey, Voice of Turkey	9785eu	
1900	1928	Vietnam, Voice of Vietnam	7280va	9730va
1900	1930	Germany, Deutsche Welle	9565af	11795af
		17860af		
1900	1930	Sun UK, Bible Voice BC	6130eu	13710af
1900	1935	DRM New Zealand, Radio NZ International	9890pa	
1900	1945	India, All India Radio	7410eu	9445af
		9950eu	11620eu	11935af
		15075af	15155af	17670af
1900	1945	USA, WYFR/Family Radio Worldwide	6085ca	
1900	1950	New Zealand, Radio NZ International	9615pa	
1900	1957	China, China Radio International	7295va	
		9435va		
1900	1957	Netherlands, Radio Netherlands	5905af	
		7425af	11660af	15335af
				15535af
1900	2000	Anguilla, Worldwide Univ Network	11775am	
1900	2000	Australia, Radio Australia	6080va	7240as
		9500va	9580va	9710as
				11880as
1900	2000	Canada, CFVP Calgary AB	6030na	
1900	2000	Canada, CKZN St John's NF	6160na	
1900	2000	Canada, CKZU Vancouver BC	6160na	
1900	2000	Costa Rica, Worldwide Univ Network	11870va	
		13750va		
1900	2000	Egypt, Radio Cairo	9380af	
1900	2000	Equatorial Guinea, Radio Africa	15190af	
1900	2000	Finland, Overcomer Ministries	6060eu	
1900	2000	Germany, The Overcomer Ministries	6175eu	
1900	2000	fas Italy, IRRS	7290va	
1900	2000	Kuwait, Radio Kuwait	11990na	
1900	2000	Malaysia, RTM/Traxx FM	7295as	
1900	2000	Netherlands, Radio Netherlands	7395af	
1900	2000	Nigeria, Radio Nigeria/Kaduna	4770do	
1900	2000	Nigeria, Voice of Nigeria/Lagos	15120af	
1900	2000	North Korea, Voice of Korea	7100af	9975va
		11535va	11910af	
1900	2000	Papua New Guinea, National BC	4890do	
1900	2000	vi Papua New Guinea, Wantok R. Light	7325va	
1900	2000	Russia, Voice of Russia	7310eu	7195eu
		7310eu		
1900	2000	vi Rwanda, Radio Rwanda	6055do	
1900	2000	fas Slovakia, European Gospel Radio	7290af	
1900	2000	vi Solomon Islands, SIBC	5020do	
1900	2000	South Africa, SA Radio League	3215af	
1900	2000	Swaziland, Trans World Radio	3200af	
		9500af		
1900	2000	Thailand, Radio Thailand	7155eu	
1900	2000	vi Uganda, UBC Radio	4976do	5026do
1900	2000	UK, BBC World Service	3255af	5875va
		5995as	6005af	6190af
		9485as	12095af	15400af
				17795af
			17830af	
1900	2000	Ukraine, R Ukraine International	7490eu	
1900	2000	USA, American Forces Radio	4319usb	5446usb
		5765usb	6350usb	7811usb
				10320usb
			12133usb	13362usb
1900	2000	USA, KJES Vado NM	15385na	
1900	2000	USA, Voice of America	4930af	6080af
		7480va	9670va	9885af
		15580af	17895af	15410af
1900	2000	USA, WBCQ Monticello ME	7415am	9330am
		17495am		
1900	2000	USA, WBOH Newport NC	5920am	
1900	2000	USA, WEWN Vandiver AL	17595af	
1900	2000	USA, WHRA Greenbush ME	17690af	
1900	2000	USA, WHRI Cypress Creek SC	9495am	
		9840na		
1900	2000	USA, WINB Red Lion PA	13570am	
1900	2000	USA, WRMI Miami FL	9955am	
1900	2000	USA, WTJC Newport NC	9370na	
1900	2000	USA, WWCR Nashville TN	9980na	12160na
		13845na	15825na	
1900	2000	USA, WWRB Manchester TN	9385va	12180va
1900	2000	USA, WYFR/Family Radio Worldwide	3230af	
		13615na	13690ca	17795af
		18930va	18980va	17845eu

1900	2000	Zambia, CVC Intl/Christian Voice	4965af	
		13590af		
1930	2000	fas Germany, Pan American BC	9515va	
1930	2000	Iran, Voice of the Islamic Rep of Iran	7205eu	
		9800eu	9925af	
1936	2000	DRM New Zealand, Radio NZ International	11675pa	
1945	2000	DRM Vatican City, Vatican Radio	9800na	
1950	2000	Vatican City, Vatican Radio	5885eu	7250eu
		9645eu		
1951	2000	New Zealand, Radio NZ International	11725pa	

### 2000 UTC - 4PM EDT / 3PM CDT / 1PM PDT

2000	2015	Sun Germany, Pan American BC	9515va	
2000	2019	Vatican City, Vatican Radio	5885eu	7250eu
		9645eu		
2000	2019	DRM Vatican City, Vatican Radio	9800na	
2000	2027	Czech Rep, Radio Prague	5930eu	11600pa
2000	2027	Vatican City, Vatican Radio	7365af	9755af
		11625af		
2000	2028	Iran, Voice of the Islamic Rep of Iran	7205eu	
		9800eu	9925af	
2000	2030	mtwhfa Albania, Radio Tirana	7460eu	13600na
2000	2030	China, China Radio International	7160eu	
2000	2030	Egypt, Radio Cairo	9380af	
2000	2030	fa Germany, Pan American BC	9515va	
2000	2030	South Africa, AWR Africa	9655af	
2000	2030	USA, Voice of America	4930af	4940af
		6080af	15580af	17895af
				3200af
2000	2045	Swaziland, Trans World Radio		17750eu
2000	2045	USA, WYFR/Family Radio Worldwide		11725pa
2000	2050	New Zealand, Radio NZ International		11675pa
2000	2050	DRM New Zealand, Radio NZ International		5960eu
2000	2057	China, China Radio International	5985af	7190eu
			7285eu	7295va
			9440va	9660eu
2000	2057	Germany, Deutsche Welle	6150af	11795af
		11865af	15205af	
2000	2057	Netherlands, Radio Netherlands	5905af	
		7425af	17810af	
2000	2059	Canada, R Canada International	11765af	
		13650af	15235af	17735af
2000	2059	Finland, Overcomer Ministries	6060eu	
2000	2100	Anguilla, Worldwide Univ Network	11775am	
2000	2100	Australia, ABC NT Alice Springs	2310do	
		4835do		
2000	2100	Australia, ABC NT Katherine	2485do	
2000	2100	Australia, ABC NT Tennant Creek	2325do	
2000	2100	Sat/Sun Australia, Radio Australia	6080va	7240as
		12080as		
2000	2100	Australia, Radio Australia	9500va	11650as
		11660pa	11880as	
2000	2100	Belarus, Radio Minsk	7105eu	7360eu
		7390eu		
2000	2100	Canada, CFVP Calgary AB	6030na	
2000	2100	Canada, CKZN St John's NF	6160na	
2000	2100	Canada, CKZU Vancouver BC	6160na	
2000	2100	Costa Rica, Worldwide Univ Network	13750va	
2000	2100	Equatorial Guinea, Radio Africa	15190af	
2000	2100	Germany, The Overcomer Ministries	5995eu	
		6175eu		
2000	2100	Indonesia, Voice of Indonesia	9525al	11785pa
		15150as		
2000	2100	Kuwait, Radio Kuwait	11990na	
2000	2100	vi Liberia, ELWA	4760do	
2000	2100	Malaysia, RTM/Traxx FM	7295as	
2000	2100	Netherlands, Radio Netherlands	6020af	
2000	2100	Nigeria, Radio Nigeria/Kaduna	4770do	
2000	2100	Nigeria, Voice of Nigeria/Lagos	15120af	
2000	2100	Papua New Guinea, National BC	4890do	
2000	2100	Papua New Guinea, Wantok R. Light	7325va	
2000	2100	Russia, Voice of Russia	7195eu	9890eu
2000	2100	vi Rwanda, Radio Rwanda	6055do	
2000	2100	South Africa, Channel Africa	3345af	
2000	2100	Spain, Radio Exterior Espana	9665eu	11625af
2000	2100	vi Uganda, UBC Radio	4976do	5026do
2000	2100	UK, BBC World Service	3255af	5875va
		6005af	6190af	9410af
		13820af	15400af	17830af
2000	2100	USA, American Forces Radio	4319usb	5446usb
		5765usb	6350usb	7811usb
				10320usb
			12133usb	13362usb
2000	2100	USA, WBCQ Monticello ME	7415am	9330am
		17495am		
2000	2100	USA, WBOH Newport NC	5920am	
2000	2100	USA, WEWN Vandiver AL	17595af	
2000	2100	mtwhf USA, WHRA Greenbush ME	7520va	
2000	2100	Sat/Sun USA, WHRA Greenbush ME	11885va	
2000	2100	asmtwh USA, WHRI Cypress Creek SC		9495am



2000	2100	f	USA, WHRI Cypress Creek SC	17650af	
2000	2100	Sat/Sun	USA, WHRI Cypress Creek SC	15665na	
2000	2100	mtwhf	USA, WHRI Cypress Creek SC	11785na	
2000	2100		USA, WINB Red Lion PA	13570am	
2000	2100		USA, WRMI Miami FL	9955am	
2000	2100		USA, WTJC Newport NC	9370na	
2000	2100		USA, WWCR Nashville TN	9980na	12160na
			13845na	15825na	
2000	2100	Sun	USA, WWRB Manchester TN	11920af	
2000	2100		USA, WWRB Manchester TN	9385va	12180va
2000	2100		USA, WYFR/Family Radio Worldwide	7430eu	
			13615na	17725sa	17795ca
			18980va		17845af
2000	2100		Zambia, CVC Intl/Christian Voice	4965af	
			13590af		
2005	2100		Syria, Radio Damascus	9330eu	12085eu
2030	2045		Thailand, Radio Thailand	9680eu	
2030	2056		Romania, R Romania International	9515eu	
			11810eu	11940na	15465na
2030	2058		Vietnam, Voice of Vietnam	7220va	7280va
			9550va	9730va	
2030	2100		Cuba, Radio Havana Cuba	9505va	11760va
2030	2100		Netherlands, Radio Netherlands	7395af	
2030	2100		Sweden, Radio Sweden	7395va	7420pa
2030	2100		Turkey, Voice of Turkey	7170va	
2030	2100		USA, Voice of America	4930af	6080af
			7555as	15580af	17895af
2030	2100	Sat/Sun	USA, Voice of America	11720af	
2045	2100		India, All India Radio	7410eu	9445eu
			9910pa	9950eu	11620va
					11715pa
2051	2100		New Zealand, Radio NZ International	13840pa	
2051	2100	DRM	New Zealand, Radio NZ International	15720pa	

### 2100 UTC - 5PM EDT / 4PM CDT / 2PM PDT

2100	2125		Turkey, Voice of Turkey	7170pa	
2100	2127		China, China Radio International	11640af	
			13630af		
2100	2130		Australia, ABC NT Katherine	2485do	
2100	2130		Australia, ABC NT Tennant Creek	2325do	
2100	2130		Austria, Adventist World Radio Europe	11955af	
2100	2130	Sat	Canada, CBC NQ SW Service	9625na	
2100	2130		Cuba, Radio Havana Cuba	9505va	11760va
2100	2130		Nigeria, Radio, National Svc/Abuja	7275do	
2100	2130		Serbia, International Radio Serbia	6100eu	
			7200eu		
2100	2130		South Africa, AWR Africa	11955af	
2100	2130		South Korea, KBS World Radio	3955eu	
2100	2145		USA, WYFR/Family Radio Worldwide	13615na	
			17795ca	18980va	
2100	2157		China, China Radio International	5960eu	
			6135eu	7190eu	7285eu
			9600eu		7325af
2100	2200		Anguilla, Worldwide Univ Network	11775am	
2100	2200		Australia, ABC NT Alice Springs	2310do	
			4835do		
2100	2200		Australia, Radio Australia	9500as	9660as
			11650pa	11660pa	11695as
			13630as	15515as	12080as
2100	2200		Belarus, Radio Minsk	7105eu	7390eu
2100	2200		Bulgaria, Radio Bulgaria	5900eu	9700eu
2100	2200		Canada, CFVP Calgary AB	6030na	
2100	2200		Canada, CKZN St John's NF	6160na	
2100	2200		Canada, CKZU Vancouver BC	6160na	
2100	2200		Costa Rica, Worldwide Univ Network	13750va	
2100	2200		Equatorial Guinea, Radio Africa	15190af	
2100	2200		Germany, Deutsche Welle	9735af	11865af
			15205af		
2100	2200		Germany, The Overcomer Ministries	5995eu	
2100	2200		Guyana, Voice of Guyana	3291do	5950do
2100	2200		India, All India Radio	7410eu	9445eu
			9950pa	11620eu	
2100	2200	vl	Liberia, ELWA	4760do	
2100	2200		Malaysia, RTM/Traxx FM	7295as	
2100	2200		New Zealand, Radio NZ International	13840pa	
2100	2200	DRM	New Zealand, Radio NZ International	15720pa	
2100	2200		Nigeria, Radio Nigeria/Kaduna	4770do	
2100	2200		Nigeria, Voice of Nigeria/Lagos	7255af	
2100	2200		North Korea, Voice of Korea	7560eu	13760eu
			15245eu		
2100	2200		Papua New Guinea, National BC	4890do	
2100	2200	vl	Papua New Guinea, Wantok R. Light	7325va	
2100	2200		South Africa, Channel Africa	3345af	
2100	2200	Sat/Sun	Spain, Radio Exterior Espana	9840eu	
2100	2200		Syria, Radio Damascus	9330eu	12085eu
2100	2200		UK, BBC World Service	3255af	3915as
			5875va	5905as	6005af
			6195as	7120af	12095af
					15400af
2100	2200		Ukraine, R Ukraine International	7510eu	

2100	2200		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb
			12133usb	13362usb	10320usb
2100	2200		USA, Voice of America	6080af	7555as
			15580af		
2100	2200		USA, WBCQ Monticello ME	5110am	7415am
			17495am		
2100	2200		USA, WBOH Newport NC	5920am	
2100	2200		USA, WEWN Vandiver AL	17595af	
2100	2200		USA, WHRA Greenbush ME	11885va	
2100	2200	Sat/Sun	USA, WHRI Cypress Creek SC		15665na
2100	2200	mtwhf	USA, WHRI Cypress Creek SC		11785na
2100	2200		USA, WHRI Cypress Creek SC		7385am
2100	2200		USA, WINB Red Lion PA	13570am	
2100	2200		USA, WRMI Miami FL	9955am	
2100	2200		USA, WTJC Newport NC	9370na	
2100	2200		USA, WWCR Nashville TN	7465na	9980na
			12160na	13845na	
2100	2200	Sun	USA, WWRB Manchester TN	11920af	
2100	2200		USA, WWRB Manchester TN	9385va	12180va
2100	2200		USA, WYFR/Family Radio Worldwide	3230af	
			740eu	11565eu	17845sf
2100	2200		Zambia, CVC Intl/Christian Voice	4965af	
2115	2200		Egypt, Radio Cairo	11550eu	
2130	2157		Czech Rep, Radio Prague	9410af	11600na
2130	2200		Australia, ABC NT Katherine	5025do	
2130	2200		Australia, ABC NT Tennant Creek	4910do	
2130	2200	mtwhfa	Canada, CBC NQ SW Service	9625na	
2130	2200		Guam, KSDA/Adventist World Radio		11850as
2130	2200		Lithuania, Mighty KBC Radio	6055eu	
2130	2200		Netherlands, Radio Netherlands	7420pa	
2130	2200		Sweden, Radio Sweden	6065va	7420pa

### 2200 UTC - 6PM EDT / 5PM CDT / 3PM PDT

2200	2210		Syria, Radio Damascus	9330eu	12085eu
2200	2220		Japan, NHK World/Radio Japan		13640as
2200	2229		Lithuania, Mighty KBC Radio	6055eu	
2200	2230		India, All India Radio	9910pa	11620pa
			11715pa		
2200	2230		Papua New Guinea, National BC		4890do
2200	2245		Egypt, Radio Cairo	11550eu	
2200	2245		USA, WYFR/Family Radio Worldwide		15770af
2200	2255		Turkey, Voice of Turkey	6195va	
2200	2256		Romania, R Romania International	7185eu	
			9675eu	9790na	11940na
2200	2257		China, China Radio International	7175eu	
2200	2300		Anguilla, Worldwide Univ Network	6090am	
2200	2300		Australia, ABC NT Alice Springs	2310do	
			4835do		
2200	2300		Australia, ABC NT Katherine	5025do	
2200	2300		Australia, ABC NT Tennant Creek	4910do	
2200	2300		Australia, Radio Australia	11840va	12010va
			13630pa	15230va	15240pa
			17785pa		15515as
2200	2300	smtwhf	Canada, CBC NQ SW Service	9625na	
2200	2300		Canada, CFVP Calgary AB	6030na	
2200	2300		Canada, CKZN St John's NF	6160na	
2200	2300		Canada, CKZU Vancouver BC	6160na	
2200	2300		China, China Radio International	9590as	
2200	2300		Costa Rica, Worldwide Univ Network	13750va	
2200	2300		Equatorial Guinea, Radio Africa	15190af	
2200	2300		Guyana, Voice of Guyana	3291do	
2200	2300	vl	Liberia, ELWA	4760do	
2200	2300		Malaysia, RTM/Traxx FM	7295as	
2200	2300		New Zealand, Radio NZ International	13840pa	
2200	2300	DRM	New Zealand, Radio NZ International	15720pa	
2200	2300		Nigeria, Radio Nigeria/Kaduna	4770do	
2200	2300		Nigeria, Voice of Nigeria/Lagos	7255af	
2200	2300	vl	Papua New Guinea, Wantok R. Light	7325va	
2200	2300		Taiwan, R Taiwan International	9355eu	
2200	2300		UK, BBC World Service	5905as	5975as
			6005af	6195as	9740as
			15400af		12095af
2200	2300		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb
			12133usb	13362usb	10320usb
2200	2300		USA, Voice of America	5895va	7120va
			7460va	7555as	9415va
			15185va		11725va
2200	2300	mtw	USA, WBCQ Monticello ME	17495am	
2200	2300		USA, WBCQ Monticello ME	5110am	7415am
			9330am		
2200	2300		USA, WBOH Newport NC	5920am	
2200	2300		USA, WEWN Vandiver AL	15665af	
2200	2300		USA, WHRA Greenbush ME	11885va	
2200	2300	Sun	USA, WHRI Cypress Creek SC		9615na
2200	2300	mtwhfa	USA, WHRI Cypress Creek SC		11785na
2200	2300		USA, WHRI Cypress Creek SC		7385am
2200	2300		USA, WINB Red Lion PA	9265am	

2200	2300	USA, WRMI Miami FL	9955am	
2200	2300	USA, WTJC Newport NC	9370na	
2200	2300	USA, WWCR Nashville TN	5070na	7465na
		9980na 13845na		
2200	2300	USA, WWRB Manchester TN	6890va	9385va
		12180va		
2200	2300	USA, WYFR/Family Radio Worldwide	11740na	
2200	2300	Zambia, CVC Intl/Christian Voice	4965af	
2230	2257	Czech Rep, Radio Prague	7345na	9415na
2230	2300	Guam, KSDA/ Adventist World Radio	15320as	
2230	2300	Papua New Guinea, National BC	9675do	
2230	2300	Sweden, Radio Sweden	9800na	
2230	2300	USA, Voice of America	9570va	11705va
		15145va		
2245	2300	India, All India Radio	9705eu	9950as
		11620as 11645as	13605as	

## 2300 UTC - 7PM EDT / 6PM CDT / 4PM PDT

2300	0000	Anguilla, Worldwide Univ Network	6090am	
2300	0000	Australia, ABC NT Alice Springs	2310do	
		4835do		
2300	0000	Australia, ABC NT Katherine	5025do	
2300	0000	Australia, ABC NT Tennant Creek	4910do	
2300	0000	Australia, Radio Australia	9660as	11840va
		12010pa 12080pa	13690pa	15230va
		15240pa 15560va	17795va	
2300	0000	Australia, Radio Australia	9660as	11840as
		12010va 12080pa	13690pa	15230va
		17785pa 17795va		
2300	0000	Bulgaria, Radio Bulgaria	9700na	11700na
2300	0000	Canada, CBC NQ SW Service	9625na	
2300	0000	Canada, CFVP Calgary AB	6030na	
2300	0000	Canada, CKZN St John's NF	6160na	
2300	0000	Canada, CKZU Vancouver BC		6160na
2300	0000	China, China Radio International	5915as	
		5990am 6145na	7180as	9460as
		11690as 11970ca		
2300	0000	China, China Radio International	9800ca	
2300	0000	Costa Rica, Worldwide Univ Network	13750va	
2300	0000	Cuba, Radio Havana Cuba	9505am	9550am
2300	0000	Egypt, Radio Cairo	9280na	
2300	0000	Guyana, Voice of Guyana	3291do	
2300	0000	India, All India Radio	9950as	11645as
		13605as		
2300	0000	Malaysia, RTM/Traxx FM	7295as	
2300	0000	New Zealand, Radio NZ International		15720pa
2300	0000	New Zealand, Radio NZ International		13840pa
2300	0000	Papua New Guinea, National BC		9675do
2300	0000	Papua New Guinea, Wantok R. Light		7325va
2300	0000	Singapore, MediaCorp Radio	6150do	
2300	0000	UK, BBC World Service	3915as	5965as
		6195as 9740as	9885as	11955as
		12010as		
2300	0000	USA, American Forces Radio	4319usb	5446usb
		5765usb 6350usb	7811usb	10320usb
		12133usb 13362usb		
2300	0000	USA, Voice of America	5895va	7120va
		7555as 9415va	9570va	11725va
		13755va 15145va	15185va	
2300	0000	USA, WBCQ Monticello ME	5110am	7415am
		9330am		
2300	0000	USA, WBOH Newport NC	5920am	
2300	0000	USA, WEWN Vandiver AL	15665af	
2300	0000	USA, WHRA Greenbush ME	5850eu	
2300	0000	USA, WHRI Cypress Creek SC		9615na
2300	0000	USA, WHRI Cypress Creek SC		11785na
2300	0000	USA, WHRI Cypress Creek SC		7315am
2300	0000	USA, WRMI Miami FL	9955am	
2300	0000	USA, WTJC Newport NC	9370na	
2300	0000	USA, WWCR Nashville TN	5070na	7465na
		9980na 13845na		
2300	0000	USA, WWRB Manchester TN	6890va	9385va
		12180va		
2300	0000	USA, WYFR/Family Radio Worldwide	15255sa	
		17750sa		
2300	0000	Zambia, CVC Intl/Christian Voice	4965af	
2300	2305	Liberia, ELWA	4760do	
2300	2315	Nigeria, Radio Nigeria/Kaduna		4770do
2300	2330	Australia, Radio Australia	15240pa	
2300	2330	USA, WBCQ Monticello ME	17495am	
2300	2345	USA, WYFR/Family Radio Worldwide		11740na
2305	0000	Canada, R Canada International		6100na
2305	0000	Greece, Voice of Greece	7475eu	9420eu
2315	2330	Croatia, Croatian Radio	9925na	
2330	0000	Australia, Radio Australia	15415as	17750va
2330	0000	Lithuania, Radio Vilnius	9875na	
2330	0000	UK, BBC World Service	9580as	
2330	0000	USA, Voice of America	7350va	9570va
		13755va 15145va	15340va	
2330	2358	Vietnam, Voice of Vietnam	9840as	12020as

## MT ENGLISH LANGUAGE SHORTWAVE STATION RESOURCE GUIDE

Albania, Radio Tirana	<a href="http://rtsh.sil.at/">http://rtsh.sil.at/</a>
Anguilla, Worldwide Univ Network	<a href="http://www.worldwideuniversitynetwork.com/">www.worldwideuniversitynetwork.com/</a>
Argentina, RAE	<a href="http://www.radionacional.gov.ar/rae/rae.asp">www.radionacional.gov.ar/rae/rae.asp</a>
Australia, ABC NT Alice Springs	<a href="http://www.abc.net.au/radio/">www.abc.net.au/radio/</a>
Australia, ABC NT Katherine	<a href="http://www.abc.net.au/radio/">www.abc.net.au/radio/</a>
Australia, ABC NT Tennant Creek	<a href="http://www.abc.net.au/radio/">www.abc.net.au/radio/</a>
Australia, CVC International	<a href="http://www.christianvision.com/">www.christianvision.com/</a>
Australia, HCJB Global	<a href="http://www.hcjb.org/">www.hcjb.org/</a>
Australia, Radio Australia	<a href="http://www.abc.net.au/ra/">www.abc.net.au/ra/</a>
Austria, AWR Europe	<a href="http://www.awr2.org/">www.awr2.org/</a>
Austria, Radio Austria Intl	<a href="http://oe1.orf.at/service/international">http://oe1.orf.at/service/international</a>
Bahrain, Radio Bahrain	<a href="http://www.radiobahrain.net/">www.radiobahrain.net/</a>
Bangladesh, Bangla Betar	<a href="http://www.betar.org.bd/">www.betar.org.bd/</a>
Belarus, Radio	<a href="http://www.radiobelaruss.tvr.by/eng/">www.radiobelaruss.tvr.by/eng/</a>
Bhutan, BBS	<a href="http://www.bbs.com.bt/">www.bbs.com.bt/</a>
Bulgaria, Radio	<a href="http://www.bnr.bg/">www.bnr.bg/</a>
Canada, CBC NQ SW Service	<a href="http://www.cbc.ca/north/">www.cbc.ca/north/</a>
Canada, Radio Canada Intl	<a href="http://www.rcinet.ca/">www.rcinet.ca/</a>
China, China Radio Intl	<a href="http://www.cri.cn/">www.cri.cn/</a>
Costa Rica, Worldwide Univ Network	<a href="http://www.worldwideuniversitynetwork.com/">www.worldwideuniversitynetwork.com/</a>
Croatia, Croatian Radio	<a href="http://www.hrt.hr/hr/">www.hrt.hr/hr/</a>
Cuba, Radio Havana	<a href="http://www.radiohc.cu/">www.radiohc.cu/</a>
Czech Rep, Radio Prague	<a href="http://www.radio.cz/en/">www.radio.cz/en/</a>
Finland, Overcomer Ministries	<a href="http://www.overcomerministries.org">www.overcomerministries.org</a>
France, Radio France Intl	<a href="http://www.rfi.fr/">www.rfi.fr/</a>
Germany, AWR Europe	<a href="http://www.awr2.org/">www.awr2.org/</a>
Germany, CVC Intl/Voice Africa	<a href="http://www.christianvision.com/">www.christianvision.com/</a>
Germany, Deutsche Welle	<a href="http://www.dw-world.de/">www.dw-world.de/</a>
Germany, Overcomer Ministries	<a href="http://www.overcomerministry.org/">www.overcomerministry.org/</a>
Germany, Pan American BC	<a href="http://www.radiopan.com/">www.radiopan.com/</a>
Germany, The Overcomer Ministries	<a href="http://www.overcomerministry.org/">www.overcomerministry.org/</a>
Germany, TWR Europe	<a href="http://www.twr.org/">www.twr.org/</a>
Greece, Voice of Greece	<a href="http://www.voiceofgreece.gr/">www.voiceofgreece.gr/</a>
Guam, AWR/KSDA	<a href="http://www.awr2.org/">www.awr2.org/</a>
Guam, TWR/KTWR	<a href="http://www.twr.org/">www.twr.org/</a>
Guyana, Voice of	<a href="http://voiceofguyana.com/">http://voiceofguyana.com/</a>
India, All India Radio	<a href="http://www.allindiaradio.org/">www.allindiaradio.org/</a>
Indonesia, Voice of Indonesia	<a href="http://www.voi-online.com/">www.voi-online.com/</a>
Iran, Voice of the Islamic Rep of Iran	<a href="http://www.2.irib.ir/worldservice/">www.2.irib.ir/worldservice/</a>
Japan, NHK World/Radio Japan	<a href="http://www.nhk.or.jp/english/">www.nhk.or.jp/english/</a>
Jordan, Radio	<a href="http://www.rtv.jo/rj/index.php">www.rtv.jo/rj/index.php</a>
Latvia, Radio SWH	<a href="http://www.radioswh.lv/index.php">www.radioswh.lv/index.php</a>
Liberia, ELWA	<a href="http://www.elwaministries.org/">www.elwaministries.org/</a>
Liberia, Star Radio	<a href="http://www.radioswh.lv/index.php">www.radioswh.lv/index.php</a>
Libya, Voice of Africa	<a href="http://www.ljbc.net/home.php">www.ljbc.net/home.php</a>
Lithuania, Radio Vilnius	<a href="http://www.lit.lt/">www.lit.lt/</a>
Malaysia, RTM/Traxx FM	<a href="http://www.traxx.net/index.htm">www.traxx.net/index.htm</a>
Malaysia, RTM/Voice of Malaysia	<a href="http://202.190.233.9/vom/utama.htm">http://202.190.233.9/vom/utama.htm</a>
Monaco, TWR Europe	<a href="http://www.twr.org/">www.twr.org/</a>
Nepal, Radio	<a href="http://www.radionepal.org/">www.radionepal.org/</a>
Nepal, Radio	<a href="http://www.radionepal.org/">www.radionepal.org/</a>
Netherlands, Radio Netherlands	<a href="http://www.radionetherlands.nl/">www.radionetherlands.nl/</a>
New Zealand, Radio NZ Intl	<a href="http://www.rnz.co.nz/">www.rnz.co.nz/</a>
Nigeria, Radio, Natl Svc/Abuja	<a href="http://radionigeriaonline.com">http://radionigeriaonline.com</a>
Nigeria, Radio/Kaduna	<a href="http://radionigeriaonline.com">http://radionigeriaonline.com</a>
Nigeria, Voice of/ Ext. Svc Lagos	<a href="http://www.voiceofnigeria.org">www.voiceofnigeria.org</a>
Oman, Radio Oman	<a href="http://www.oman-tv.gov.om">www.oman-tv.gov.om</a>
Pakistan, Radio	<a href="http://www.radio.gov.pk">www.radio.gov.pk</a>
Papua New Guinea, NBC	<a href="http://www.nbc.com.pg/">www.nbc.com.pg/</a>
Papua New Guinea, Wantok R. Light	<a href="http://wantokradio.net/">http://wantokradio.net/</a>
Philippines, Radio Pilipinas	<a href="http://www.radiopilipinas.com/">www.radiopilipinas.com/</a>
Poland, Polish Radio	<a href="http://www.polskieradio.pl/zagranica/gb/">www.polskieradio.pl/zagranica/gb/</a>
Romania, Radio Romania Intl	<a href="http://www.rri.ro/">www.rri.ro/</a>
Russia, Voice of Russia	<a href="http://www.vor.ru/world.html">www.vor.ru/world.html</a>
Saudi Arabia, BSKSA	<a href="http://www.saudiradio.net/">www.saudiradio.net/</a>
Singapore, MediaCorp Radio	<a href="http://www.mediacorpradio.sg">www.mediacorpradio.sg</a>
Singapore, Radio Singapore Intl	<a href="http://www.rsi.sg">www.rsi.sg</a>
Slovakia, Radio Slovakia Int	<a href="http://www.rsi.sk">www.rsi.sk</a>
Solomon Islands, SIBC	<a href="http://www.sibconline.com.sb/">www.sibconline.com.sb/</a>
South Africa, AWR Africa	<a href="http://www.awr2.org/">www.awr2.org/</a>
South Africa, Channel Africa	<a href="http://www.channelafrica.org">www.channelafrica.org</a>
South Africa, Trans World Radio	<a href="http://www.twr.org/">www.twr.org/</a>
South Korea, KBS World Radio	<a href="http://rki.kbs.co.kr/english/">http://rki.kbs.co.kr/english/</a>
Spain, Radio Exterior Espana	<a href="http://www.ree.rne.es/">www.ree.rne.es/</a>
Sri Lanka, SLBC	<a href="http://www.slbc.lk">www.slbc.lk</a>
Swaziland, Trans World Radio	<a href="http://www.twr.org/">www.twr.org/</a>
Sweden, Radio	<a href="http://www.sr.se/rs/english/">www.sr.se/rs/english/</a>
Syria, Radio Damascus	<a href="http://www.rtv.gov.sy/">www.rtv.gov.sy/</a>
Taiwan, Radio Taiwan Intl	<a href="http://english.rti.org.tw/">http://english.rti.org.tw/</a>
Thailand, Radio	<a href="http://www.hsk9.com/">www.hsk9.com/</a>
Turkey, Voice of	<a href="http://www.trt.net.tr">www.trt.net.tr</a>
UK, BBC World Service	<a href="http://www.bbc.co.uk/worldservice/">www.bbc.co.uk/worldservice/</a>
UK, Bible Voice BC	<a href="http://www.biblevoice.org/">www.biblevoice.org/</a>
UK, FEBA	<a href="http://www.feba.org.uk">www.feba.org.uk</a>
UK, Sudan Radio Service	<a href="http://www.sudanradio.org/">www.sudanradio.org/</a>
Ukraine, Radio Ukraine Intl	<a href="http://www.nrcu.gov.ua/">www.nrcu.gov.ua/</a>
USA, American Forces Radio	<a href="http://myafn.dodmedia.osd.mil/">http://myafn.dodmedia.osd.mil/</a>
USA, KNLS Anchor Point AK	<a href="http://www.knls.org/">www.knls.org/</a>
USA, KTNB Salt Lake City UT	<a href="http://www.ktnb.org/">www.ktnb.org/</a>
USA, KWHR Naalehu HI	<a href="http://www.kwhr.org/">www.kwhr.org/</a>
USA, Voice of America	<a href="http://www.voanews.com/">www.voanews.com/</a>
USA, WBCQ Monticello ME	<a href="http://www.wbcq.com/">www.wbcq.com/</a>
USA, WBOH Newport NC	<a href="http://www.fbnradio.com/">www.fbnradio.com/</a>
USA, WEWN Vandiver AL	<a href="http://www.ewtn.com">www.ewtn.com</a>
USA, WHRA Greenbush ME	<a href="http://www.whr.org/">www.whr.org/</a>
USA, WHRI Cypress Creek SC	<a href="http://www.whr.org/">www.whr.org/</a>
USA, WINB Red Lion PA	<a href="http://www.winb.com/">www.winb.com/</a>
USA, WMLK Bethel PA	<a href="http://www.wmlkradio.net">www.wmlkradio.net</a>
USA, WRMI Miami FL	<a href="http://www.wrmi.net/">www.wrmi.net/</a>
USA, WTJC Newport NC	<a href="http://www.fbnradio.com/">www.fbnradio.com/</a>
USA, WWCR Nashville TN	<a href="http://www.wwcr.com">www.wwcr.com</a>
USA, WWRB Manchester TN	<a href="http://www.wwrb.org/">www.wwrb.org/</a>
USA, WYFR/Family Radio Worldwide	<a href="http://www.worldwide.familyradio.org">www.worldwide.familyradio.org</a>
Uzbekistan, CVC International	<a href="http://www.christianvision.com/">www.christianvision.com/</a>
Vatican City, Vatican Radio	<a href="http://www.vaticanradio.org">www.vaticanradio.org</a>
Vietnam, Voice of Vietnam	<a href="http://www.vov.org.vn">www.vov.org.vn</a>
Yemen, Rep of Yemen Radio	<a href="http://www.yemenradio.net">www.yemenradio.net</a>
Zambia, CVC Intl/Christian Voice	<a href="http://www.christianvision.com/">www.christianvision.com/</a>



## Monitoring Montgomery Military

**A**s you travel around the country you will find the occasional hotspot for military monitoring. On a recent trip we discovered that Montgomery, Alabama is one of those hotbeds of military communications.

The main Department of Defense player in the area is Maxwell Air Force Base (KMXF) and this base is managed by the 42 Air Base Wing. The 42nd has a long lineage in Air Force history, with the squadron first standing up in August 1941. In the more recent past, on October 1, 1994, Air Education and Training Command (AETC) headquarters inactivated its 502d Air Base Wing at Maxwell and replaced it with the newly designated 42nd Air Base Wing. AETC further assigned the wing to Air University.

The 42nd now serves as the host unit for Maxwell AFB and Gunter Annex. The wing's primary mission is to provide support for Air Force mission requirements, Air University, and the Maxwell-Gunter community. The only aircraft assigned to the 54th Airlift Flight are the C-21s which provide operational support for the Air University, US Transportation Command, and the Air Mobility Command.

Maxwell is also the home of the 908 Airlift Wing. The 908th AW is Alabama's only Air Force Reserve unit. The 908th AW contributes to the nation's defense by providing airlift and related services through the efforts of more than 1,200 Reservists and eight C-130 Hercules aircraft. Unit Reservists fly nearly one million miles annually, engaging in training and supporting real world operations. The day-to-day operations of the 908th are handled by a group of 175 civil servants known as Air Reserve Technicians who also serve as Reservists, and a small number of civilian employees who do not have Reserve status.

In addition to the aeronautical frequencies

below, there are two Motorola trunk radio systems that serve the Maxwell-Gunter complex.

### MAXWELL AFB, ALABAMA (KMXF)

#### Aeronautical Frequencies

118.150	Maxwell Tower
120.550	Atlanta ARTCC Approach/Departure Services
121.200	Montgomery Approach (North)
124.000	Montgomery Approach (South)
127.150	Ground Control
134.700	ATIS
139.300	Pilot to Dispatcher
234.600	42nd ABW Command Post
253.500	Maxwell Tower
270.250	Atlanta ARTCC Approach/Departure Services
289.400	Ground Control
342.300	Metro
363.025	Montgomery Approach (South)
372.200	Pilot to Dispatcher
380.225	Montgomery Approach (North)
396.900	908AW Command Post "Toil Ops"

#### LMR Frequencies

##### MAXWELL AFB

Motorola Type II SmartZone Trunk Radio System  
Analog and APCO-25 Common Air Interface  
Base Frequency: 406.1000; Spacing: 12.5 kHz;  
Offset: 380  
Motorola System ID: 6a2c  
Frequencies: 406.1625/415.1625  
407.9625/416.9625 408.7625/417.7625  
409.7125/418.7125 410.7625/419.7625c

##### MAXWELL AFB-GUNTER ANNEX

Motorola Type II SmartZone Trunk Radio System  
Analog and APCO-25 Common Air Interface  
Base Frequency: 406.1125 MHz; Spacing: 12.5 kHz; Offset: 380  
Motorola System ID: bc21  
Frequencies: 406.1125/415.1125c  
406.3625/415.3625c 407.2875/416.2872  
410.3625/419.3625

#### Talkgroups

32316	Maxwell Commander's Net
32880	Maxwell Unknown user/usage
32912	Maxwell Civil Engineer Services
33072	Maxwell/Gunter Annex Fire Dispatch Net
33104	Maxwell/Gunter Annex Fire Crash Net
33232	Maxwell/Gunter Annex Fire Tactical 1
33264	Maxwell/Gunter Annex Fire Tactical 2
33488	Maxwell/Gunter Annex Security Police
33584	Maxwell Security Police (Special Event)
33808	Maxwell Base Operations
33872	Maxwell Aircraft Refueling
34000	Maxwell Civil Engineers <Channel 1>
34032	Maxwell Civil Engineers <Channel 2>
34064	Maxwell Civil Engineers <Channel 3>
34096	Maxwell Civil Engineers <Channel 4>

34128	Maxwell Civil Engineers <Channel 5>
34160	Maxwell Civil Engineers <Channel 6>
34192	Maxwell Civil Engineers <Channel 7>
34384	Maxwell Unknown user/usage
34448	Maxwell Unknown user/usage
34512	Maxwell Unknown user/usage
34544	Maxwell Communications
34604	Maxwell Building Maintenance
34704	Maxwell Base Transportation
34834	908th ARW Unknown usage
35088	Maxwell Unit Commanders Course (UCC)
37072	Maxwell Command Post
37104	Maxwell Unknown usage
37136	908th ARW Aircraft Operations
37264	908th ARW Unknown usage
37296	908th ARW Maintenance
37552	Maxwell Radio Maintenance
37776	Maxwell Officer Training School
37808	Maxwell Logistics Flight
38096	Air University TV/Audio Control

### ❖ Alabama Air National Guard

Maxwell doesn't house the only military units in the Montgomery area. The Air National Guard has a fighter wing located at Dannelly Field, a.k.a. Montgomery Regional Airport. The 187th Fighter Wing is the home of a squadron of F-16C Fighting Falcon aircraft.

The roots of the 187th Fighter Wing date back to 1952 when the Alabama Air National Guard organized the 160th Tactical Reconnaissance Squadron in Birmingham, Alabama equipped with the RF-51 Mustang. The squadron moved to Dannelly Field on January 1, 1953.

This unit (then a Group) went through several airframe changes, but in October 1988 the Group converted to the F-16 aircraft. In October 1995, the Group was designated a Wing under Air Force reorganization, becoming the 187th Fighter Wing.

Immediately following the September 11, 2001 attacks on the World Trade Center and the Pentagon and the downing of United Airlines Flight 93 in a Pennsylvania field, the 187th was called into action. Within hours of the attacks, the 187th had jets in the air flying Combat Air Patrol missions over the largest cities in the southeastern United States. The unit sustained this effort for Operation Noble Eagle for one year following the events of September 11.

The 187th was again called to active duty in January 2003 until April 2003 as part of the largest military mobilization since the 1991 Gulf War. This marked the largest unit activation in the unit's 50 year history, with over 500 personnel being deployed along with aircraft and equipment for Operation Iraqi Freedom. The 187th, as an integral part of the Total Force, deployed to an undisclosed



A 187FW F-16 taxis out for a mission in the local area. (USAF Photo)



**An 908th Airlift Wing C-130 lifts off from the Maxwell AFB, Ala.(USAF Photo)**

Middle Eastern location as the lead unit, commanding a mixture of Air National Guard, Air Force Reserve, Active Air Force, and British Air Force units comprising the 410th Air Expeditionary Wing. This marked the largest integration of coalition Air and Special Forces Operations in history, with over 3,500 personnel operating out of this location. The 410th's mission was to prevent Iraqi missile launches against coalition forces and neighboring countries.

In September 2004 the unit again deployed over 300 personnel with aircraft and equipment to Al Udeid, Qatar, for Operation Iraqi Freedom. This deployment also marked a significant first for the unit and the U.S. Military. The 187th was the first unit to ever use the GBU-38 in combat. The GBU-38 is a 500 lb, global positioning system (GPS) guided bomb which, while being very effective, minimizes collateral damage. The GBU-38 is a precision-guided munition commonly referred to as a "Smart Bomb." This weapon was effectively employed by the 187th in the Battle of Fallujah.

The unit enjoyed nineteen years and over 55,000 flight hours without a Class A aircraft mishap and has received numerous Flight Safety awards from the Air Force Air Combat Command and the Air National Guard for its safety record. The Wing has also been recognized by Air Combat Command and the 9th Air Force Inspector General for excellence during Operational Readiness Inspections and Unit Compliance Inspections over the last two decades.

The Air National Guard isn't the only National Guard Bureau unit at Dannelly. The Alabama Army National Guard has an aviation support facility on the south side of the airport. Although primarily oriented to helicopter operations, fixed-wing aircraft can also be accommodated.

#### **MONTGOMERY REGIONAL AIRPORT (Dannelly Field) (KMGM)**

##### **Aeronautical Frequencies**

38.200	Army National Guard Operations
40.300	187FW ANG Operations
122.100	Flight Service Station – Anniston (transmit only)
118.300	Clearance Delivery
118.850	Montgomery Approach (North)
119.700	Dannelly Tower/CTAF
120.500	Atlanta ARTCC Approach/Departure Services
120.675	ATIS
121.200	Montgomery Approach (South)
121.700	Ground Control
122.100	Flight Service Station – Anniston (receive only)
122.200	Flight Service Station – Anniston
122.550	Flight Service Station – Anniston
122.850	Single Frequency Approach

122.950	Unicom
124.000	Montgomery Approach (North)
132.450	Montgomery Approach (South)
149.775	Army National Guard Operations
226.350	Army National Guard Operations
255.400	Flight Service Station – Anniston
255.600	Montgomery Approach (North)
270.250	Atlanta ARTCC Approach/Departure Services
270.300	Clearance Delivery
276.800	187FW ANG Operations "Bama Ops"
284.000	Single Frequency Approach
322.500	Montgomery Approach (South)
348.600	Ground Control
360.850	Dannelly Tower
363.025	Montgomery Approach (South)
372.200	Single Frequency Approach
380.225	Montgomery Approach (North)

I would like to thank Michael Sharritt for providing us with some updates on the Montgomery systems while we were in the area.

#### **❖ Civil Air Patrol Frequency Update**

Using research from on-air reception, here is our latest frequency list for the Civil Air Patrol.

##### **CAP HF FREQUENCIES HF Voice Frequencies (USB)**

Freq	Geographic Area of Coverage	Designator
2371.0	Nationwide	AA
2374.0	Nationwide	AB
4466.0	Northeast Region Primary	NA
4466.0	Southeast Region Secondary	SB
4469.0	Southeast Region Primary	SA
4469.0	Northeast Region Secondary	NB
4506.0	North Central Region Primary	CA
4509.0	North Central Region Secondary	CB
4582.0	Middle East Region Secondary	MB
4582.0	Pacific Region Secondary	PB
4585.0	Middle East Region Primary	MA
4585.0	Pacific Region Primary	PA
4601.0	Rocky Mountain Region Primary	RA
4601.0	Great Lakes Region Secondary	GB
4604.0	Great Lakes Region Primary	GA
4604.0	Rocky Mountain Region Secondary	RB
4627.0	Southwest Region Primary	WA
4630.0	Southwest Region Secondary	WB
7341.0	Nationwide	AC
7635.0	Nationwide National Calling Frequency	AD
7920.0	Nationwide	PC
14902.0	Nationwide National Calling Frequency	AE
18205.0	Nationwide	AF
20873.0	Nationwide	AG

##### **ALE Net frequencies (ALE/USB)**

4477.0	4522.0	4585.0	5006.0	6806.0	7602.0
8012.0	9047.0	10162.0	11402.0	12081.0	
13415.0	14357.0	17412.0	19814.0	kHz	

Numerous additional HF assignments are being added in preparation for a dedicated Automatic Link Establishing (ALE) HF net in each region. More monitoring is needed to determine the composition of these nets.

##### **CAP VHF Frequencies**

Freq	Usage/Mode	Designator
121.7750	Practice Beacons	
122.9000	AM voice	
123.1000	AM voice	
143.7500	FM voice repeater input 148.125	PB
143.9000	FM voice repeater input 148.150	PA
148.1500	FM voice repeater output	V1
148.1250	FM voice repeater output	V2
148.1375	FM voice ground tactical simplex	V3
149.5375	FM voice air-to-ground/air-to-air	V4

#### **❖ New LA Air Force TRS**

Chris Parris is reporting that there may be a new 380-400 MHz Air Force trunk radio system in the Los Angeles area.

System ID: 157	Site No: 170
WACN: BEE00	NAC: 150
Frequencies: 385.0875/395.0875 c	
385.3250/395.3250	

So far I have not seen any reports of any voice communications on this system, so it has not been determined who the user is in the Los Angeles area.

What makes this system interesting is the System ID/WACN. It is the same ID/WACN that is used at Peterson AFB in Colorado. The Peterson system is believed to be sponsored by the Air Force Space Command, and if the LA system is associated with Peterson, it might originate from Los Angeles AFB.

#### **❖ Camp Atterbury Freq Profile**

An anonymous contributor passed along the following information for Camp Atterbury in Indiana.

"I was at Camp Atterbury recently and noted that there is no trunk radio system on UHF frequencies in the 406-420 MHz range. There is no P25 or Motorola trunk system in the 380-400 MHz range. I did not check for any EDACS systems, but I'm guessing there is not.

Now, with government mandated narrow-banding taking place on the VHF and UHF frequencies, I believe most of what is being posted is wrong for Atterbury, and I believe it is currently in the process of changing (or has changed)."

Here is a list of frequencies that our field reporter monitored during his visit.

38.9000	Range Control legacy frequency
41.9000	MedEvac is a legacy frequency
126.2000	CTAF
138.0375	Range Control Primary (Repeater output (151.4 Hz PL)
138.7125	Logistics/Transportation repeater output, not 100% sure on usage yet (151.4 Hz PL)
139.975	Fire Department, not confirmed
140.4000	Data Transmission.
141.0250	Unknown user/usage repeater output, active key ups
141.5750	Air to Air "Viper" units (AM)
164.7000	Atterbury Job Corp, no PL found.
173.3125	Unknown user/usage, sounded like portables. Could this be another Job Corp frequency? (DCS025)
240.3500	Unknown user/usage
317.8000	Indianapolis Approach/Departure Control
383.3000	Air Range Control Primary
856.2375	Edinburgh Correctional Institution (DCS073)

Many thanks to our anonymous contributor for the Camp Atterbury update. If you have a frequency list you would like to share, please pass it along to the address in the masthead. Until next time, 73 and good hunting.



## More on Federal Interoperability

As we have discussed previously here in the *Fed Files*, communications interoperability has become the latest priority for both federal and local public safety organizations. The ability for different agencies with different radio frequencies or incompatible radio systems to be able to talk to each other has been the goal of communications engineers and system designers for years. But the emphasis on interoperability, or "interop" was given a big boost after the terrorist attacks of 9/11/2001.

One solution to the interoperability problem is simply to provide common radio channels that different agencies all have access to. There are now a large number of VHF, UHF and 700/800 MHz channels set aside as common channels for all public safety agencies across the United States. A complete listing of these channels can be found here: [www.monitoringtimes.com/html/mt\\_interop\\_freqs.pdf](http://www.monitoringtimes.com/html/mt_interop_freqs.pdf)

In addition to these frequencies, the National Telecommunications and Information Agency (NTIA) has allocated a number of VHF and UHF channels for federal agency interoperability. This allows different federal agencies some common radio channels where none had previously existed.

Here are the current NTIA allocated Federal Interoperability frequencies. I have seen two different channel names for some of these frequencies, so I have included both:

1FCAL-35	162.0875	4FLAW-47D	410.1875
1FCAL-36	162.2625	LE-11/LE-17	410.1875
1FCAL-37	162.8375	4FCAL-52D	410.2375
1FCAL-38	163.2875	IR-15	410.2375
1FCAL-39	163.4250	4FTAC-53D	410.4375
1FCAL-40	164.7125	IR-10/IR-16	410.4375
1FCAL-41	165.2500	4FLAW-48D	410.6125
1FCAL-42	165.9625	LE-12/LE-18	410.6125
1FCAL-43	165.5750	4FTAC-54D	410.6375
1FCAL-35D	167.0875	IR-11/IR-17	410.6375
LE-1	167.0875	4FTAC-55D	410.8375
1FLAW-36D	167.2500	IR-12/IR-18	410.8375
LE-2/LE-6	167.2500	4FTAC-56	413.1875
1FCAL-44	167.3250	IR-13	413.1875
1FLAW-37D	167.7500	4FTAC-57	413.2125
LE-3/LE-7	167.7500	IR-14	413.2125
1FLAW-38D	168.1125	4FCAL-45D	414.0375
LE-4/LE-8	168.1125	LE-B	414.0375
1FLAW-39D	168.4625	4FLAW-49	414.0625
LE-5/LE-9	168.4625	LE-13	414.0625
1FCAL-40D	169.5375	4FLAW-50	414.3125
NC-1	169.5375	LE-14	414.3125
1FTAC-41D	170.0125	4FLAW-51	414.3375
IR-1/IR-6	170.0125	LE-15	414.3375
1FTAC-42D	170.4125	4FLAW-47	419.1875
IR-2/IR-7	170.4125	4FCAL-52	419.2375
1FTAC-43D	170.6875	4FTAC-53	419.4375
IR-3/IR-8	170.6875	4FLAW-48	419.6125
1FTAC-44D	173.0375	4FTAC-54	419.6375
IR-4/IR-9	173.0375	4FTAC-55	419.8375
4FLAW-46D	409.9875	4FLAW-46	419.9875
LE-10/LE-16	409.9875		

And the following frequencies are allocated to federal government itinerant use:

163.1000 163.7125 167.1375 168.6125  
173.6250 407.5250 409.0500 409.0750  
409.3375 412.8250 412.8375 412.8500  
412.8625 412.8750 412.8875 412.9000  
412.9125 416.5250 418.0500 418.0750  
418.3375

It's always a good idea to keep these interoperability frequencies in your active scan list. As federal agencies upgrade to new radio gear, the new radio programming almost always includes these channels. I can confirm that these frequencies are available in radios belonging to the BATFE, CBP Border Patrol, CBP Customs, Coast Guard, FBI, ICE and others.

### ❖ The "25 Cities Project"

In addition to the frequencies listed above, the Justice Department has initiated a program they call the "25 Cities Project" to help with federal communications interoperability in major metropolitan areas of the country. Some information on this project can be found here: [www.cops.usdoj.gov/default.asp?Item=1518](http://www.cops.usdoj.gov/default.asp?Item=1518).

The interoperability solutions for each city seem to be based upon what is available to the area public safety agencies and what might be the best way for federal agencies to communicate amongst themselves and other agencies. Some areas have multiple VHF or UHF repeaters and others have only single channel repeaters. Many of these cities have also wired interconnection to federal agency dispatch offices and can patch communications circuits between systems.

Here is a rundown of the 25 cities involved in the Department of Justice project, and what the known radio systems are. Unless noted with a CTCSS tone squelch value, all these repeaters are using P-25 digital mode.

#### 1-ATLANTA

Listeners in the Atlanta area should be able to monitor a single VHF conventional federal interoperability repeater. This repeater is maintained by the FBI and serves as a common channel for command and control personnel during any sort of emergency. I have no information from listeners as far as regularly scheduled check-ins or tests.

- ATL FIO 170.4750 MHz

#### 2-BALTIMORE

The Baltimore area is served by a VHF federal interoperability repeater. This repeater is also maintained by the FBI and is available to all federal agencies in the Baltimore area. Again, I have no information as far as regular use or

testing of this interoperability repeater.

- BAL FIO 170.6625 MHz

#### 3-BOSTON

The Boston Metro area has more than one federal interoperability solution at this time. The primary system is a VHF repeater linked directly to the Boston Area Police Emergency Response Network (BAPERN) UHF frequency. This system was apparently put into place for the Democratic Convention in 2004 and has remained in place.

The Department of Justice also implemented a second federal VHF standalone repeater on a US Coast Guard allocated channel. This channel also supports regular USCG liquid natural gas operations.

And a third repeater is available to federal users during a multi-agency response.

- BOS FIO 165.3250 MHz
- BAPERN FIO 167.4375 MHz, 167.9pl – patch to BAPERN 470.7875 MHz
- BPD FIO 158.9100 MHz

#### 4-CHARLOTTE

Federal agencies in the Charlotte, North Carolina region have access to the large 800 MHz Charlotte-Mecklenburgh County trunked radio system. A cache of portable 800 MHz trunked radios is provided to agencies such as DHS CBP and ICE, DEA, US Marshals Service, the Secret Service and the North Carolina Air National Guard.

#### 5-CHICAGO

The Chicago area has six new federal interoperability repeaters that were installed in 2006. In order to cover the large metro area effectively, they have placed these radio sites in the north, south and central areas of the city. The channels consist of a "command" and a "tactical" repeater for each of the three areas of the city.

- CH CMD C (COMMAND CENTRAL)  
171.6875 MHz
- CH CMD N (COMMAND NORTH)  
170.8125 MHz
- CH CMD S (COMMAND SOUTH)  
171.4375 MHz
- CH TAC C (TACTICAL CENTRAL)  
172.2125 MHz
- CH TAC N (TACTICAL NORTH)  
168.8875 MHz
- CH TAC S (TACTICAL SOUTH)  
168.9125 MHz

#### 6-DALLAS/FORT WORTH

The DoJ has installed two conventional VHF repeaters in downtown Fort Worth and two additional repeaters in downtown Dallas. These repeaters, along with eight voting receivers, are maintained by the FBI and provide federal interoperability throughout the DFW metropolitan area.

- DFW EAST 170.7250 MHz
- DFW WEST 171.4375 MHz

## 7-DENVER

Federal interoperability in the Denver area is based upon the Colorado statewide digital trunked radio system (DTRS). This system is a P-25 800 MHz system and federal users have both control stations that can access the trunked system as well as a cache of 800 MHz hand-held radios for federal agencies to utilize.

## 8-DETROIT

Federal interoperability in both the Detroit area and Michigan statewide is supported through the Michigan Public Safety Communications System (MPSCS). This is also an 800 MHz, P-25 trunking system that federal agencies have access to via control stations and hand-held radios. In addition, the FBI has built a deployable mobile cross band system that can tie VHF, UHF and 800 MHz frequencies together for interoperability between agencies with different type radio systems.

## 9-HAMPTON ROADS / NORFOLK, VA

The Hampton Roads/Norfolk metropolitan area is using a single VHF repeater installed by the FBI. Listeners have reported both clear and encrypted traffic on this channel, as well as weekly check-ins between the various agencies utilizing this system.

- HRN FIO 165.7000 MHz

## 10-HONOLULU

In addition to having access to the local public-safety radio systems, federal agencies in Honolulu have a single VHF analog federal interoperability repeater for their use. The DoJ project information indicates that federal agencies that have access to the federal interoperability channel include ATF, DHS CBP and ICE, DEA (via dual-band mobile radios), the FBI, US Marshals Service, and the US Secret Service.

- HNL FIO 170.6250 MHz, 167.9 PL

## 11-HOUSTON

Two VHF repeaters in the Houston area are now available for federal agency interoperability. These frequencies have also been referred to as "L1" and "L2", which are the channel numbers in the FBI radios that were originally testing these repeaters.

- HOU CMD 170.7250 MHz
- HOU TAC 171.4375 MHz

## 12-JACKSONVILLE

A single VHF repeater serves the Jacksonville area federal interoperability needs. This repeater can be patched to other area public safety radio systems if needed. The US Navy facilities in Jacksonville and Mayport have control stations that access this repeater.

- JAX FIO 171.4375 MHz

## 13-LOS ANGELES

The Los Angeles Regional Tactical Communications System (LARTCS) has been providing interoperability between federal, state and local agencies. Here is a rundown of the frequencies that are patched together for this system:

California National Guard 036.5000 MHz  
HEAR 155.3400 MHz  
NALEMARS 155.4750 MHz, 156.7 PL  
Coast Guard Channel 23A 157.1750 MHz  
LA INTEROP D 159.0300 MHz  
LA INTEROP C 159.1800 MHz  
Federal UHF I/O 406.8000 MHz, 156.7 PL  
LACSO MA-1 483.5875 MHz, 186.2 PL  
LACSO MA-2 484.0875 MHz, 186.2 PL  
LACSO MA-3 483.7875 MHz, 186.2 PL  
LACSO MA-4 484.1375 MHz, 186.2 PL  
LACSO MA-5 484.0625 MHz, 186.2 PL  
I-CALL 866.0125 MHz, 156.7 PL  
CLEMARS 8 868.5125 MHz, 156.7 PL

In addition to the existing LARTCS, there are two standalone VHF repeaters in the Los Angeles area. I have not yet heard any confirmation that these repeaters are on the air.

- LA FIO 1 163.1000 MHz
- LA FIO 2 162.8875 MHz

## 14-MIAMI

Federal agencies in the Miami area have access to the 800 MHz National Mutual Aid channels as well as a single site VHF federal repeater. This repeater was reported to have been installed in 2006 and was utilized during the Super Bowl in February of 2007. Local listeners are reporting some activity on this repeater, but no organized check in or testing activity so far. I have not been able to confirm the input frequency yet.

- MIA FIO 171.4375 MHz

## 15-NEW ORLEANS

The New Orleans area now has its own federal interoperability, narrow band VHF repeater, and, in addition, federal agencies have access to the New Orleans trunked radio system, as well as the State of Louisiana's trunked radio system.

- NOLA FIO 171.4375 MHz

## 16-NEW YORK CITY

The Big Apple has two federal repeaters tied together as a federal interoperability system. The VHF repeater is using P-25 digital, and the UHF repeater is analog. Interesting to note that the UHF frequency is allocated to the US Postal Inspectors, but apparently it has been commandeered for use in this interoperability project.

- NYC FIO 167.7875 MHz
- NYC FIO 414.7500 MHz, 82.5 PL

## 17-PHILADELPHIA

Federal agencies in the Philly area have been heard using their VHF interoperability repeater with regularly scheduled tests. Some of the agencies involved in the tests include FEMA, Federal Protective Service, the US Mint, the FBI and the DEA. Agencies with VHF radios can talk directly in to the repeater, and those without VHF radios have control stations tied in to the system.

- PH FIO 171.4375 MHz

## 18-PHOENIX

Federal interoperability communications in Phoenix can use multiple radio systems. One is the Inter-Agency Radio System, or IARS. This is a number of VHF and UHF repeaters tied together to link agencies with dissimilar radio bands. Federal agencies also have radio consoles and portable radios on the Phoenix Regional Wireless Network (PWRN) and the Mesa Trunked Open Arizona Network (TOPAZ).

At one time there was a federal VHF trunked site that was part of the PWRN trunked system. However, a few months prior to the Super Bowl in 2008, the VHF sites were taken off the air.

## 19-PORTLAND, OR

Federal agencies operating in the Portland area have access to the local 800 MHz public safety trunking system. There are talk groups allocated for the various agencies use, as well as control stations and radios available. In addition, the federal IWN trunked system is operational in and around the Portland metro area, and at some point there will be interconnection between the IWN P-25 trunked system and the 800 MHz radio system.

At this time I have not confirmed any conventional federal interoperability repeaters in the Portland area, although I suspect there might be one.

## 20-SAN DIEGO

San Diego area federal agencies can make use of the San Diego City and County 800 MHz trunked systems with control station and portable radio access. Communications dispatchers also have the ability to patch from their trunked systems to some federal "mutual aid" or "multi-agency" channels. These channels are not directly related to the "25 Cities Project," but are part of the DHS Border Patrol P-25 network throughout southern California. Listeners have reported patches between these federal frequencies and other agencies:

- MA-4 SP 166.9125 MHz
- MA-4 PM 167.3750 MHz
- MA-4 DM 167.5250 MHz
- MA-4 MCC 167.7250 MHz
- MA-4 CP 170.8375 MHz
- MA-1 CP 171.1750 MHz
- MA-1 PM 172.2875 MHz
- MA-1 SP 172.4500 MHz

## 21-SAN FRANCISCO

There are two VHF federal interoperability repeaters in the San Francisco area. The channels appear to be called "Federal Mutual Aid" and "Mutual Aid." They are reportedly tied with two UHF repeaters, but I do not have any information on the UHF channels at this time.

- SF FED MA 171.6125 MHz
- SF MA 168.7625 MHz

## 22-SEATTLE

The Seattle/Tacoma, Washington, metropolitan areas are served with several large 800 MHz trunked radio systems. Federal interoperability in these cities relies on control stations and portable radios that can access these trunked systems. It also involves patches to these systems as well as the federal Integrated Wireless Network, or IWN. The IWN is a P-25 VHF federal trunked system that is operating in the Pacific Northwest. At this time I have not confirmed any conventional federal interoperability repeaters in the Seattle area.

## 23-ST. LOUIS

The FBI has installed both VHF and UHF interoperability repeaters in the St. Louis area. I have information on the VHF channels, but have not yet confirmed any of the UHF repeaters that are supposed to be tied to this system.

- STL CALL 171.4375 MHz
- STL TAC 171.6875 MHz

## 24-TAMPA

The DOJ has installed a single VHF repeater as a federal interoperability channel for the Tampa area. Federal agencies can be patched from this repeater in to other local public safety agencies via a digital bridging system.

- TAM FIO 171.6875 MHz

## 25-WASHINGTON, DC

The Washington, DC area, already awash with federal channels, has even more to support federal interoperability with local public safety. These four VHF repeaters, maintained by the US Marshals Service, are reportedly linked to some UHF repeaters as well, but I have not been able to confirm the UHF frequencies. In addition to the VHF and UHF federal channels, the federal agencies also have a VHF channel that is a patch to the DC Metro Police trunked radio system.

- DCIO 1 159.1500 MHz, MPD Citywide Patch
- DCIO 2 168.8750 MHz
- DCIO 2 N 173.7500 MHz
- DCIO 2 S 168.0875 MHz
- DCIO 2 W 166.7875 MHz



## Radio, Cruises and Photography

**2**008 was a heavy winter here in Eastern Ontario. We had nearly record-level snowfalls which seemed to take forever to melt. The ice and wind caused my R-8 vertical to fall down and I had to wait for a snow-free roof to raise the antenna. With the help of George VE3GHK, Bert VE3KBW, Jim VA3JHR, and Dave VE3HFX, the task was accomplished. HF signals are again flowing into the shack and I am not suffering the symptoms of HF radio withdrawal. However, installing a new roof and eaves caused my dipoles to be brought down, so I have them yet to refurbish and raise.

Early in February, I got a call from a friend, Capt. Louis Tellier, who offered to install an AIS receiver here. This Automatic Identification System is a transponder on all vessels in the Great Lakes. It works on marine VHF channels and keeps track of vessel position, speed, course and other data. This is also used in all major ports and waterways. I will have more detail in the October column after the receiver has been here awhile.

As for myself, there is quite a bit of traveling coming up. By the time this column is in your hands, my wife and I will have finished a cruise from Miami to Vancouver via the Panama Canal. I have already packed my Sangean portable HF receiver, my VHF marine radio, and my T90A amateur handheld. I hope to get some interesting transmissions during the voyage. We have never been in this part of the world and just could not pass up the chance to enjoy a trip we may never get to do again. I am also going to try for a few QSL cards from stations I hear.

I have also been asked to return as first mate on the small cruise ship *Canadian Empress*. Voyages between Kingston and Quebec City as well as Kingston and Ottawa will keep me busy for the summer. Beside VHF Marine radio, the vessel is AIS equipped. I will be able to learn more about this communications mode in my off hours. The hours on the Seaway will also provide great opportunities for some marine photos.

### ❖ St. Lawrence Seaway

By using the Internet and VHF radio, I was able to track a famous ship this spring. The information obtained allowed me to drive down the Seaway and photograph the barge ATL 2701. This vessel is the ex-*Irving Whale*. People may remember she was sunk in eastern Canada and remained there for many years. However, her oil cargo became an environmental hazard and she was raised from quite a depth. She is now a cargo barge.

I checked the Seaway web site and saw she

was in the system. By monitoring as she called in at Seaway checkpoints, I was able to be at Brockville as she passed. Usually I wait at the first Seaway lock, but I heard she had to tie up for inspection, so I went back up the river, as daylight would have run out before she finished inspection. (Just another example of how monitoring radio can be of use.)

The VHF radio is alive here. Seaway traffic has been heavy and there was a lot of ice this year. Early in the season the ships had a slow passage through the system.

Seaway Clayton and Seaway Sodus are using channel 12 (156.600 MHz) this year. They are trying it to see if it can be used without interfering with stations further east in the system. They previously used channel 13 (156.650 MHz); however, this channel is used by the New York State Barge Canal and they interfered with each other. Channel 13 is now reserved for bridge-to-bridge communication between commercial ships.

I visited Rob Pringle at VBR Prescott Radio this spring and learned that the DSC (Digital Selective Calling) equipment has been installed. They also have refurbished their tower at Gananoque, Ontario. I expect we will have announcements about this service before long.

DSC is now part of the course for a Marine Radio License here in Canada. People must be aware of what DSC is, what it can do and what you need to install it. Of course, DSC is the main aspect of the GMDSS (Global Marine Distress Safety System) that pleasure craft users will need to incorporate.

Again I remind listeners that Marine channels 11 (156.550 MHz), 12 (156.600 MHz), 13 (156.650 MHz), and 14 (156.700) are commonly used for traffic control.

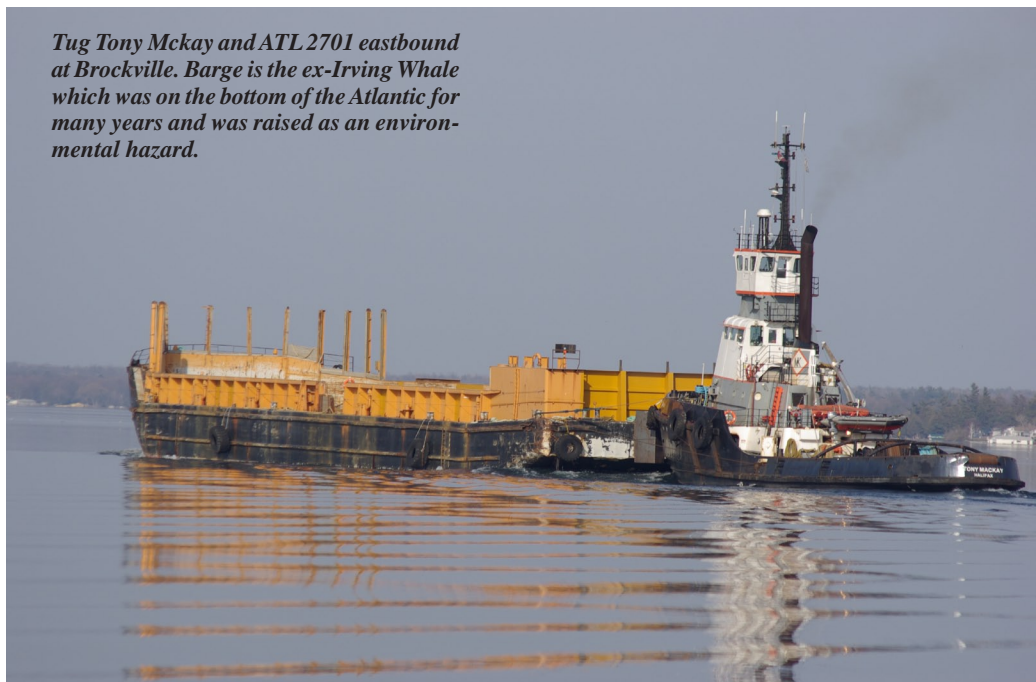
### ❖ Arctic HF

During the summer months, some Canadian arctic marine stations become active. They are active from mid May until late October. If you wish to look up information for Canadian marine stations, you can access the publication *Radio Aids to Marine Navigation* at [www.ccg-gcc.gc.ca/mcts-sctm/ramn/docs/index\\_e.htm#ae](http://www.ccg-gcc.gc.ca/mcts-sctm/ramn/docs/index_e.htm#ae). There is an East Coast and West Coast edition. Geographic location, schedules, frequencies and modes of transmission are given.

VFA Inuvik, Northwest Territories, is located near the mouth of the MacKenzie River. The station has remote facilities located at Hay River, Enterprise, Parson's Lake, Cambridge Bay and Yellowknife. Cambridge Bay is operational from July 15 to October 10. The frequency listing for VFF shows they use simplex frequencies of 2182, 2558, 5803, and 6218.6 kHz USB. They also have duplex channels 403, 601, 826 and 1214: Transmit frequencies are 4363, 6501, 8794 and 13116 kHz USB. The corresponding ship transmit frequencies are 4071, 6200, 8270 and 12269 kHz USB.

HF voice broadcasts of weather and notices to shipping are scheduled at 0115 and 1315 UTC using 5803 kHz from Inuvik and 4363 at Hay River. Cambridge Bay broadcasts at 0235 and 1435 UTC on 2558, 4363 and 6218.6 kHz. Radio-facsimile broadcasts are made at 0200 and 1630

*Tug Tony McKay and ATL2701 eastbound at Brockville. Barge is the ex-Irving Whale which was on the bottom of the Atlantic for many years and was raised as an environmental hazard.*



UTC on 8456 kHz. Details of the radiofacsimile transmission can be found in *Radio Aids to Marine Navigation*.

VFF Iqaluit is located on Baffin Island. This station controls remotes at Killinek, Coral Harbour, and Resolute. Ship to shore communications are conducted on 2182 kHz and 2582 kHz. Duplex channels 403, 603, 812 and 1201 are also used: VFF transmits on 4363, 6507, 8752 and 13077 kHz, while receiving on 4071, 6206, 8228 and 12230 kHz. Distress and safety communications are also handled on 4125, 6215, 8791, 12290 and 16420 kHz. VFF is DSC equipped on 4207.5, 6312, 8414.5, 12577 and 16804.5 kHz

HF radiotelephone broadcasts are scheduled from Coral Harbour at 0110 and 1320 UTC on 2514 and 6513 kHz. Resolute broadcasts at 1240 and 2310 UTC on 2582 and 4363 kHz. Broadcasts from Killinek on 2514 kHz and Iqaluit on 2582, 4363 and 6507 kHz are scheduled at 1340 and 2235 UTC. However, they combine all of the above transmitters and frequencies to broadcast at 1705 UTC. Radiofacsimile transmission is broadcast from Iqaluit on 7710 kHz and from Resolute on 3253 kHz. They are scheduled at 0010, 0600, 0700, 0800, 0900, 2100, 2125 and 2300 UTC.

VFF also has Navtex facilities. They broadcast French language Navtex on 490 kHz at 0300, 0700, 1100, 1500, 1900 and 2300 UTC. The English Navtex is broadcast on 518 kHz 10 minutes later.

I hope you have good luck and catch some of these transmissions during the summer months.

## ❖ West Coast

Again I had some interesting correspondence from our West Coast reporter, John Musgrave. He reports VAE Prince Rupert radio on 2054 kHz with weather broadcasts. Although it is not a marine frequency, the Yukon Trappers Net on 4441 kHz is interesting.

John did report he has received the Australian marine broadcasts very well at his location in British Columbia. He reported VMC Charleville, Queensland at 1044 UTC on 8176 kHz. VMW at Wiluna Western Australia came in well at 1202 UTC on 2056 and 8113 kHz. I have yet to catch

*Atlantic Erie eastbound at Mariatown, reflected in the cold(!) spring water.*



these here, but now that my antenna is up, I will have to get up early in the morning and give it a try.

VMC voice broadcasts are on 4426 and 16540 during the daytime and 2210 and 6507 during the night. 8176 and 12365 are used all the time. VMW broadcasts on 4149 and 16528 during the daytime while 2056 and 6230 are used at night. 8113 and 12362 are used all the time.

The Australian stations have a long broadcast schedule, so if propagation is good you should hear them.

## ❖ Amateur Radio

In closing I want to mention the amateur radio station that is being planned for the retired USCG Icebreaker *Mackinaw*. An HF station is planned along with HF/UHF repeaters. The call sign is W8AGB. Located in Mackinaw City, Michigan, the recently retired ship joins the *Queen Mary* and the Battleship *New Jersey* on a short list of museum ships with active amateur stations. Don't forget to monitor 14,300 USB for some

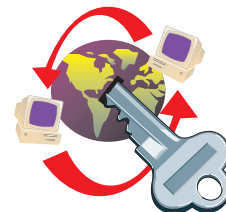
interesting amateur marine communications on the Maritime Net.

I wish you all smooth sailing and good DX for the summer. Any reports of radio reception in your area are certainly welcome.

73 Ron VE3GO

## MT READERS ONLY

To access the restricted website for the month of July, go to [www.monitoringtimes.com](http://www.monitoringtimes.com), click on the key, and when prompted, enter "mtreader" under the user name. Your password for July is "hotdog" – Check in each month for new material!



## Longwave Resources

✓ **Sounds of Longwave** CD or Audio Cassette (please specify) featuring WWVB, Omega, Whistlers, Beacons, European Broadcasters, and more! **\$13.95** postpaid

✓ **The BeaconFinder** A 65-page guide listing Frequency, ID and Location for hundreds of LF beacons and utility stations. Covers 0-530 kHz. **\$13.95** postpaid

Kevin Carey  
P.O. Box 56, W. Bloomfield, NY 14585

## Books by Ernest H. Robl:

*THE BASIC RAILFAN BOOK*

*UNDERSTANDING INTERMODAL*

*THE POWDER RIVER BASIN*

Detailed descriptions at

<http://www.robl.w1.com>

*Tug Jarret M. This was the Jarret McKeil but has been sold. She has no stack markings and is on her last trip out of the Lakes.*





## Digging Deeper

**N**ot everyone is interested in the nitty-gritty details of beacon reception. For many, it is enough to know the location of a station and perhaps the name of the facility that it serves. Still, I find that many *MT* readers are accustomed to digging a bit deeper. For serious “ute” monitors, it is often the details that make the difference between an ordinary intercept and one that is worth putting in the logbook.

This month, we’ll look at some little-known facts about beacons and discuss how these tidbits of data may affect your listening. Even if you’re not a DX hound, the information will provide insight on why beacons operate the way they do.

### ❖ ID, Please

Did you know that many beacons can transmit additional information besides their ID? For example, to indicate that operation has switched to emergency power or to a backup transmitter, some stations automatically append a “dit” (Morse letter E) to their ID. A few years ago, beacon ENS/400 kHz (Ensenada, Mexico) was often heard in this mode – sporting an ID of “ENS-E.”

Several Canadian beacons also have a clever way of indicating their status. Normally, there is a 600 millisecond (ms) space between the end of the ID and the long dash that is common to virtually all Canadian beacons. However, when there is an AC power failure and operation switches to backup power, the ID changes to three cycles of 600 ms spacing and three cycles of 1200 ms spacing.

Should a beacon’s main transmitter fail and switch over to a reserve unit, the normal 600 ms spacing is extended to 1200 ms on every ID cycle, and will continue in this way until the problem is fixed.

Speaking of Canadian Beacons, did you know there are a handful of special IDs reserved for *transportable* beacons? If you’re lucky enough to hear UAA, UFF, UGG, UJJ, UNN, USS, UTT, UWW or UZZ, you’ll know you’ve tuned one in. Transportable beacons might be used at temporary airfields, air shows, or other military operations.

Finally, there are two common pitches used in North America; 400 Hz and 1020 Hz.

With few exceptions, 400 Hz is used in Canada, and 1020 Hz is used in the United States. Telling these tones apart is easy and can be a first indicator of a beacon’s location.

### ❖ It’s Your Call

Did you ever wonder why beacons don’t send conventional “K” or “W” call signs like other radio stations? Most beacons operate under the auspices of the Federal Aviation Administration, which, as a government agency, does not come under Federal Communications Commission control. For this reason, you will not typically find aviation beacons listed in FCC databases claiming to cover the “whole spectrum.” The *BeaconFinder II* directory (advertised under *Longwave Resources* in this issue) does cover all FAA beacons, plus many other stations operating in the 0 to 535 kHz spectrum.

### ❖ What Goes Up...

Many FAA beacons include a “V” shaped antenna that is usually orange in color. This antenna is not part of the longwave equipment, but is for a separate 75 MHz marker beacon housed in the same shelter as the LF equipment. Marker beacons transmit a tightly focused beam straight up to help pilots determine when they are directly over the beacon site.



“V” shaped antennas at many longwave sites are for a separate 75 MHz marker beacon. This one is at LH/334 kHz, Bloomington, IL.

### ❖ On the Road Again

Have you ever been traveling and come across what you suspect might be an LF beacon? Here’s a trick that may help you find the

answer: It is often possible to hear the second or third harmonic of a beacon on your car’s AM radio. I used this trick while on vacation to hear EVB/417 kHz at New Smyrna Beach, Florida, near 834 kHz ( $417 \times 2 = 834$ ). Of course, you must be quite close to the station (1/8 mile or so) for this to work.

### ❖ Better Reception

I’m often asked to provide some tips for improved LW reception. Here, in no particular order, are some techniques that have proven helpful to me over the years. These tips should be even more helpful during the challenging summer months when static can be a problem:

**Tune slowly to avoid missing signals!** Beacons are usually assigned to 1 kHz intervals. If you tune too fast, you might skip right over some good DX.

**When trying for distant beacons, use your receiver’s BFO or SSB/CW setting.** You’ll find it much easier to sort through weak signals by “zero beating” their carriers and listening to the keyed Morse ID.

**Use a narrow bandwidth setting.** A narrow filter (500 Hz or less) will go a long way toward blocking out adjacent “pest” signals.

**Use a good set of headphones.** They will help you focus on weak signals and avoid disturbing others around you.

**Use a loop or active antenna specifically designed for longwave.** Despite their small size, these antennas often outperform “longwire” types, and almost always provide quieter reception. If possible, turn off static-producing appliances such as TV sets, computers, dimmer switches, electric motors, florescent lights, etc.

### ❖ New England Updates

A few months ago, we ran a list of New England beacons to try for. Bob Fraser (ME) pointed out some discrepancies in the list and also provided an expanded list which I plan to share next month. Here are the immediate corrections: 362/FMH (Cape Cod) has recently been reactivated and is located at the headquarters of the Massachusetts National Guard; 216/BID (Block Island) is off air; 194/TUK is off air.

This last one was an oversight on my part while editing the list. This well-known powerhouse left the air several years ago.

*See you next month!*

## Strom Gets 23 Months in Prison

**K**evin Alfred Strom may not be a household name in the pirate radio community, but he is among the most notorious figures in the history of shortwave radio broadcasting in North America. For several years, Strom was the voice of **American Dissident Voices**, an ultra-far right wing program produced by the neo-Nazi National Alliance organization. This program had a variety of shortwave broadcast relays, including the old **WRNO** on 7355 kHz in New Orleans.

### American Dissident Voices



American Dissident Voices producer Kevin Alfred Strom at the microphone.

Verification of Reception:

To: **GEORGE ZELLER**  
Date: **5-10-92** Time: **0115**  
Frequency: **7355**  
Transmitter: **WRNO**  
*Yellowstone*

Although it was never conclusively proven, many veteran DXers claimed to recognize Strom's voice from the classic USA pirate/ clandestine station the **Voice of To-Morrow**. That one signed on with a characteristic interval signal of a Nazi kettle drum followed by a howling wolf. This interval signal was probably the most chilling musical theme in shortwave radio history. Programming featured ultra-right wing political discussions. Despite a strong signal and numerous broadcasts, this clandestine operated freely during the late 1980s and early 1990s from a location somewhere within the United States with no interference from the Federal Communications Commission.

Strom resurfaced after a long absence from the public eye because of a criminal conviction in early May. Numerous media, including the Charlottesville, VA *Daily Progress* and **WVIR-TV** Channel 29 news in Charlottesville, reported on Strom's criminal trial held in US District Court in Charlottesville.

In January 2007, Strom was arrested on child pornography charges related to an August 2006 raid on his home. Law enforcement authorities seized a computer at his home that contained pornographic images of children. Strom's initial trial resulted in a dismissal of intimidation and

incitement charges. But, in mid-April of 2008, Strom was sentenced to 23 months in jail on the remaining child pornography charges, to which he had pled guilty. Some of the sentence will be suspended with credit for time already served in Virginia jails, but as of press time for *MT*, it is unclear how much additional time will be served by Strom in the Virginia prison system. He will be forced to register as a sex offender in Virginia.

Strom's estranged wife Elisha testified against him during the trial. The Charlottesville *Daily Progress* reported that Elisha had come home one day to discover Strom viewing pornography on his computer while naked. Subsequently, as part of a resolution of an argument with his wife, Strom signed a contract to obtain pedophilia counseling from the Family Life Resource Center in Harrisonburg, VA.

Thus, the quasi-clandestine **American Dissident Voices** has come to a sorry end.

### ❖ Congrats

We send our congratulations this month to Brad Grier. He heard **Mac Shortwave** on 6850 kHz, and it was his first pirate logging. Good work!

### ❖ What We Are Hearing

*Monitoring Times* readers heard three dozen different pirate radio stations this month. You can hear them, too, if you use some simple techniques. Pirate radio stations never use regularly announced schedules, but shortwave pirate broadcasting increases noticeably on weekends and major holidays. You sometimes have to tune your dial up and down through the pirate radio band to find the stations, but more than 95% of all North American shortwave pirate broadcasts are heard on **6925 kHz**, plus or minus 30 or 40 kHz.

**Common Man Radio**- They are still testing with their signature classical music piece by Aaron Copland, from which the station name is derived. (None)

**Devil Radio**- This new station is a **WYFR** parody. It blends rock music with edited clips of a preacher. (None)

**Dit Dah Radio**- The concept at this new pirate is promotion of Morse Code. All IDs and all music relate to the code. (None; report to the FRN)

**KNBS**- Relays of Phil Muzik's classic shows as the voice of the California Marijuana Cooperative are increasingly common. (Belfast)

**JBCN**- The James Brownyard Communications Network mixes pirate radio comedy with serious technical advice to pirate operators. (Try Belfast)

**Liquid Radio**- Activity continues from this one, which is dominated by techno-pop electronic dance music. (None)

**MAC Shortwave**- Paul Star's replica of the old top 40 commercial radio format still moves his transmit-

ter around the bands. He's been on 3275, 6850, 6925 and 6950 kHz recently. (macshortwave@yahoo.com)

**Maple Leaf Radio**- They use the Canadian national anthem as both an interval signal and a sign-off tune. Otherwise, they play classic rock and folk music with a Canadian artist emphasis. (radio.mapleleaf@gmail.com)

**Mash Up Radio**- Classic rock and disco music are their normal format. (None)

**Moonshine Radio**- It is unclear if this new pirate is a pun on Sunshine Radio. Their format is classic rock. (None)

**Northwoods Radio**- Their loon call interval signal precedes broadcasts of classic rock music "from the Great Lakes." (northwoodsradio@yahoo.com)

**Numbers Stations**- For some reason, a few pirates are broadcasting numbers messages lately, perhaps as a parody or memorial to actual "spy" numbers stations. (None)

**Radio Caroline**- This famous and historic Europirate still occasionally gets North American shortwave pirate relays of their satellite programming. (None)

**Radio Corbain**- Not surprisingly, the programs on this pirate are dominated by Nirvana rock music. (None)

**Radio Clandestine**- Somebody has dusted off old classic rock and comedy shows with announcer R. F. Burns. Many think that this was the best produced pirate of all time. (None)

**Radio Ice Cream**- The Ice Cream Man is back with a combination of rock music and stories for children. (Belfast)

**Radio Jamba International**- Rock music and ironic comedy are their usual format. (Belfast)

**Radio Metallica Worldwide**- Dr. Tornado's old super-powered pirate shows have returned, apparently via a **WHYP** relay. (Try whypradio@gmail.com)

**Radio Nonsense**- This veteran station came back out of the woodwork on April 15 with a tax day parody show. (None)

**Radio Pigmeat International**- Their rock music shows have nothing to do with the commodities market in Pork Bellies. (Belfast)

**Radio Three**- One of the numbered shortwave pirates has returned, primarily with rock music broadcasts. (None)

**Random Radio**- Their format varies. Recently they have featured rock music and ironic comedy. (None; report via the FRN web site)

**Relaxation Radio**- They use a Woody Woodpecker interval signal as an introduction to their 1940s pop music shows. (None)

**Sycko Radio**- This veteran pirate blends rock music with pirate radio news coverage. (syckoradio@yahoo.com)

**The Crystal Ship**- The Poet's "Voice of the Blue States Republic" uses variable frequencies such as 1710, 3430, 5385, and 6700 kHz for rock music and leftist political commentary. (Belfast and tcshortwave@yahoo.com)

**The Wave**- Classic rock is the normal fare on this relatively new operation. (None)

**Uncle Bob**- This elderly announcer plays pop music that is older than he is. There are hints that the station may be related to **Special Ed**. (None)

**United Patriot Militia Bingo**- The parody of the now defunct **KSMR** clandestine from Kentucky has returned. John T. Arthur wins all of their rigged bingo games. (None)

Continued on page 61



## Make Your Fest a Festival

I went to what has become a fairly typical Hamfest recently. The gates opened around 8a.m. to what was essentially a flea market and folks were packing up to go home before noon. Folks milled about looking at the tables, said hi to a few friends and did little else. Most seemed in a hurry to get out of there to participate in some other recreational activity.

This was nothing like the Hamfest experiences I had when I first got into the hobby. It was nothing like the Hamfests that made me really want to grow as an amateur radio operator. It wasn't all that long ago that I found most Hamfests to be all day affairs encompassing much more than a few meager tables full of nearly cast off electronics. These Hamfests were true *festivals* of the ham radio experience. What happened?

Lots of folks tend to blame the flat growth of the hobby or internet based equipment sales. But there's more to this shrinking Hamfest syndrome than those matters. (Cue the heroic music as Old Uncle Skip climbs up on his high ham radio horse.)

I think many clubs and groups that put on these shows have fallen into a pattern where they think they can set up a bunch of vendor tables, schedule one round of VE testing and feel they have done their bit to put a few bucks in the club coffee fund.

Folks, the hobby deserves better than that! We come together in ham clubs, in part, to make the hobby exciting for ourselves and for other folks who have an interest in the hobby. We can also use our Hamfest efforts to reach out to our community and to encourage new growth in the ham hobby. (Okay, you can cut the music now as Skip jumps off the horse and walks over to the lectern.)

As you know by now, I never point out a problem without coming up with a few solutions. Let me begin this path to Hamfest revival with a radical challenge.

### ❖ NO! I SAY THREE TIMES: NO FLEA MARKET!!!

Let's be honest with each other here. Sadly, with a few notable exceptions such as Dayton, most ham flea markets have become fairly shabby shows. A few folks hoping against hope that they can offload some gear that wasn't even worth wiping the mildew off. Is it any wonder nobody wants to show up and they all want to run off to play golf before lunch? So let's just drop that part of the plan from the get go.

Now... Don't you feel relieved? With the flea market out of the way, we can concentrate on creating a celebration of all things ham radio.

This is going to be a leap of faith for many folks. I also won't deny that it is going to take a lot more effort and organization. You're also going to need to find a spot for your show that isn't just an open cow pasture. That said, a predominantly indoor ham radio gathering will be successful regardless of the outdoor elements. No more risking a washed out flea market.

### ❖ MAKE THE TIME AND MAKE IT COUNT

Come up with a game plan to make your Festival of Ham Radio a more or less all day event. You won't need to open the gates early for flea market Vendors, so you can plan to run something that starts around 8a.m. and runs until late afternoon, say 4p.m. Don't worry, we're going to talk about how to fill that time.

### ❖ FORUMS

If you have been reading *MT* for any length of time, you may have heard about the Kulspville Winter SWL Fest. This is decidedly not a ham radio gathering. It is devoted primarily to shortwave listening.

Still, the ham radio world could learn a thing or two from this event. It has been in business for over 20 years through all the ebbs and flows of the general radio hobby. It has remained successful largely because of its consistent presentation of excellent forums on the radio listening art. (And *Winterfest* has kept costs down by making it a volunteer effort. *MT's* excellent conventions with multiple forum tracks proved too expensive to maintain. - ed.)

Any Festival of Ham Radio should include a number of forums on topics that would expand folk's interest and understanding of the hobby. I am sure you have more than a few members of your club who have the "gift of gab." Put them to work coming up with presentations or demonstrations on Safety, Antenna Design, Mobile Operating, DXing, PK331 – the list goes on. Come up with half a dozen or so hour long presentations and you are well on your way to making a great ham radio day.

Don't forget to reach out to your area ARRL, ARES/RACES and SKYWARN officials. They always have something valuable to share and should jump at the chance to be part of your event.



### ❖ SPECIAL INTEREST GROUPS

After attending your forums, some folks will want to continue the conversation beyond the hour allotted. Not a problem. Set up a few of those unused flea market tables as breakout special interest group locations for folks to expand upon what they have just heard in the formal forum. You may even want to designate some "SIG" spaces for things not covered in forums. People like to chew the rag face to face just as much as they do over the air. Make this practice welcome at your Festival of Ham Radio.

### ❖ VE TESTING

Volunteer Examination sessions are the greatest tool we have to grow and advance the hobby. If your club does not have an active VE program, consider starting one. Meanwhile, reach out to the VEs in your area and arrange for testing sessions throughout the day. By offering ongoing opportunities to test, you give folks a chance to walk off their pre-test jitters and then be able to

#### UNCLE SKIP'S CONTEST CALENDAR

**RAC Canada Day Contest**  
July 1, 0000 UTC - 2359 UTC

**MI QRP July 4th CW Sprint**  
July 4, 2300 UTC - July 5, 0300 UTC

**QRP ARCI Summer Homebrew Sprint**  
July 6, 2000 UTC - 2400 UTC

**IARU HF World Championship**  
July 12, 1200 UTC - July 13, 1200 UTC

**FISTS Summer Sprint**  
July 12, 1700 UTC - 2100 UTC

**North American QSO Party, RTTY**  
July 19, 1800 UTC - July 20, 0600 UTC

**CQ Worldwide VHF Contest**  
July 19, 1800 UTC - July 20, 2100 UTC

**RSGB IOTA Contest**  
July 26, 1200 UTC - July 27, 1200 UTC

put their best effort out to get licensed or to upgrade. The VE sessions should be in a room that isn't disturbed by the other activities going on at the gathering. Nobody wants to hear a bullhorn announcing the winner of the 50/50 while they are trying to calculate the resonant frequency of a dipole.

## ❖ VE PREPARATION

Kept well separate and distinct from the VE sessions to avoid impropriety, why not have a quiet room where folks can sit and read their study guides over one last time? Maybe even have an experienced ham or two on hand to help with review. Nobody likes to go into the test completely cold. A little cramming and a pat on the back for support just might be the key to bringing another person into the amateur radio hobby.

## ❖ CONTESTS

Now let's talk a bit about bringing back another old Hamfest tradition that seems to have fallen by the wayside... Contests. There are lots of possibilities here, but let me just bring up a few I have always enjoyed.

### Homebrew Contest

Our hobby still harbors quite a few folks who like to put together their own radio gear. Any Festival of Ham Radio should take steps to celebrate and encourage this practice. Invite folks to bring their projects to the show and have a good old fashioned County Fair style judging complete with a Blue Ribbon for first prize. You can even set it up with classes of entries by degree of difficulty. I would include a special class for beginners or first time builders.

A variation on this theme that would take a bit more effort but would be lots of fun, would be a build-off. Set up some soldering irons and have folks build a simple "ugly construction" code oscillator. You can sell the kits for this project for a few dollars and have folks compete against time to get the thing built and working.

### QLF Contest

What is QLF? It is, normally, a derogatory ham radio term for someone with a bad CW fist. It means "It sounds like this guy or gal is sending with their left foot!"

Well, a QLF contest is just that. Wire up a hand key to a code oscillator and have folks send with their tootsies. You will be hard pressed to see anything funnier.

### QRQ Contest

We go from the ridiculous to the sublime. A QRQ contest is one where you crank up the code speed until there is nobody left standing. Any good PC-based code program will let you raise the speed by increments of one half word per minute. Start sending 5 character groups for 1 minute and keep turning up the wick a half word per minute. What makes this such a fun contest is that, once you get a bit past 25 WPM, some of the real old timers get their moment in the sun. I know more than one ham with a commercial or military background who can still keep it up well past 50 WPM.

You may want to have a couple of manual typewriters on hand. Serious code folks like to work with a "mill" when the speed is up. The

room gets really quiet when the speeds get up there into the QRQ region. It is an experience not to be missed and it is perfect for a Festival of Ham Radio.

## ❖ OPERATING POSTIONS

We are celebrating ham radio, right? So how about giving folks a chance to do a little operating? Break out your field day set ups and get a few signals out on the air. Just like Field Day, you will be giving folks a chance to try out new bands and modes. You will also give curious non-hams a chance to see what this thing is all about.

## ❖ SPECIAL EVENTS STATION

And, since you have a station set up, why not have a Special Event station to make it all worth while? Use the club call to just celebrate the fest. If you plan ahead, you can even apply for a Special Event call sign to really mark your Festival of Ham Radio.

## ❖ INVITE LOCAL OFFICIALS

Make some space for your local public service officials. Police, Fire and EMS departments can bring out their public information displays. These will not only be of interest to gathered hams, they will also be a drawing point for the general public. While they are looking at the police's D.A.R.E display, you can also invite them to get to know about ham radio.

## ❖ INVITE OTHER CLUBS

Ben Franklin told the Continental Congress "We must, indeed, all hang together, or most assuredly we shall all hang separately." This idea of a Festival of Ham Radio may be an undertaking

### Outer Limits continued from page 59

**Voice of Hell-** Their hit parade from Hell features dire sounding music in a minor key. (Post Office does not deliver to Hell)

**Voice of the Abnormal-** Another old-timer has returned, this time with a marijuana advocacy show. (Elkhorn address defunct)

**WAIR-** They say that the call letters stand for All Indy Radio, but rock and folk music dominate their broadcasts. (None)

**WBNY-** Commander Bunny is still running for President of the USA, but several Swift Boat stations are also active. It is sometimes hard to tell which ones are real and which ones are fake. (Belfast and *rodent-revolutionhq@yahoo.com*)

**Wolverine Radio-** They continue to feature rock and new age music. (None)

**WHYP-** James Brownard is back with his memorial pirate. He's a parody of an actual medium wave station in North East, PA. (*whyp1530@partlycloudy.com*)

**WNKR-** Andy Walker's trip to the USA has resulted in multiple North American relays of his Western North Kent Radio Europirate. (*wnkr@rock.com*)

**WTCR-** The music on Twentieth Century Radio is from "the 2000s." That varies from rock to early 20<sup>th</sup> century pop. (Belfast)

## ❖ QSLing Pirates

Reception reports to pirate stations require three first class stamps for USA maildrops or \$2 US to foreign locations. The cash defrays postage for mail forwarding and a souvenir QSL to your mailbox. Letters go to these addresses, identified above in parentheses: PO Box 1, Belfast, NY 14711; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 146, Stoneham, MA 02180; and PO Box 293, Merlin, Ontario N0P 1W0. Unfortunately, PO Box 69, Elkhorn, NE 68022 is no longer a valid address,

that is too large for one club to organize. So why not use it as a time and place for clubs from all over your region to come together and celebrate the greatest hobby in the world?

## ❖ ADVERTISE

There is more to getting the word out about your Festival of Ham Radio than putting a blurb in *QST*. You really want to get the word out in your area. Most of your attendees will likely come from within 25 miles or so of your event location. Saturate this area with as much advertising as you can muster. You will want to put posters up at every electronics/computer/radio oriented business in your region. Make up flyers for area schools and get them in the hands of math, science, technology and social studies teachers. Get your event in local news papers and on local radio stations.

## ❖ PREPARATION

Whenever I try to go into a big project, I always remember what someone once told me. "How do you eat an apple? One bite at a time!" Make a list of the tasks at hand, form a few sub-committees, and develop all the aspects of the event. There will be a few stumbling blocks and more than a few mistakes the first time around. But these are all just lessons learned for next year's event.

## ❖ HAVE A GREAT DAY!

The preparation will all be worth it. You will have a ham radio event that folks will talk about for years to come. AND... they will come back next year.

Have fun! I'll see you on the bottom end of forty meters.

although a few pirates announce it.

Some pirates prefer e-mail, bulletin logs or internet web site reports instead of snail mail correspondence. The best bulletin for submitting pirate loggings is now the e-mailed *Free Radio Weekly* newsletter, free to contributors via *freeradioweekly@gmail.com*. A few pirates will sometimes QSL reports left on the outstanding Free Radio Network at *www.frn.net*. *The ACE*, a former widely read print bulletin, now has a good loggings section and a valuable archive of *Free Radio Weekly* issues on its *www.theaceonline.com/ web site*.

## ❖ Thanks

Your loggings and news about unlicensed broadcasting stations are always welcome via 7540 Highway 64 W, Brasstown, NC 28902, or via the e-mail address atop the column. We thank this month's valuable contributors: Brian Alexander, Mechanicsburg, PA; John T. Arthur, Belfast, NY; Kirk Baxter, North Canton, OH; Artie Bigley, Columbus, OH; Jerry Berg, Lexington, MA; Scott Blixt, Minneapolis, MN; Ralph Brandi, Middletown, NJ; Commander Bunny, Belfast, NY; Rich D'Angelo, Wyomissing, PA; Gerry Dexter, Lake Geneva, WI; Bill Finn, Philadelphia, PA; Harold Frodge, Midland, MI; Captain Ganja, Belfast, NY; Brad Grier, South Sioux City, NE; William T. Hassig, Mt. Prospect, IL; Harry Helms, Smithville, TX; Ed Ininger, Summit, NJ; Don Jensen, Kenosha, WI; Ed Kusalik, Coaldale, Alberta; Chris Lobdell, Tewksbury, MA; Greg Majewski, Oakdale, CT; A. J. Michaels, Blue Ridge Summit, PA; Don Moore, Davenport, IA; Adrian Peterson, Indianapolis, IN; John Poet, Belfast, NY; Jim Ronda, Tulsa, OK; Robert Ross, London, Ontario; Martin Schoech, Eisenach, Germany; Jerry Strawman, Des Moines, IA; and Joe Wood, Greenbriar, TN.



## A Portable, Non-Directional Antenna for VHF-UHF

There are many different versions of vertical antennas in use in radio communications today. They range from the small ground-plane, and J-pole designs found at microwave and VHF-UHF frequencies, to the Marconi, quarter-wavelength verticals often used by DXers on the high-frequency band, to the towering steel structures found at many AM, medium-wave broadcast stations, and even into the lower-frequency bands.

Vertical antennas provide non-directional coverage, which is essential for many communication situations. They are also vertically polarized, which supports long-haul communication well on the high-frequency band and lower frequencies, and is the predominant polarization on the VHF and UHF bands.

### ❖ Some Design Variations

The oldest of the vertical designs is the Marconi quarter-wavelength vertical. This design was derived from that of the half-wavelength dipole by Guglielmo Marconi himself. Later, George Brown and his associates derived the basic ground-plane antenna design.

Several variations on the basic ground-plane antenna design have been developed since that time. As these designs progress from the simple quarter-wavelength to the extended-length designs, there is an increased flattening of the antenna's radiation-reception pattern. On VHF and higher frequencies, this is the feature that concentrates both the antenna's transmitting and receiving performance farther out along the earth's surface, where most of the action on these bands occurs.

The most common of the ground-plane antennas is the quarter wavelength design. As suggested above, extending the vertical element of the ground plane antenna design to a half-wavelength increases not only the antenna's gain a bit, but provides a radiation-reception pattern relatively closer to the earth where it does the most good. These improvements are increased as we go to the 5/8 wave design, and even more so if we add multiple 1/2-wavelength elements, as is done in the collinear design.

All of the antenna designs mentioned above are useful designs. However, consider now another vertical antenna: the J-pole. The J-pole is essentially a half-wavelength element attached to the end of a quarter-wavelength matching section of transmission line. Thus, the J-pole has the gain of a half-wavelength element, and, like the ground-plane antenna, has a low-angle radiation-reception pattern. The J-pole also has the advantage that it requires no ground-plane: this makes it somewhat easier to construct than a ground-plane antenna.

### ❖ Let's Make a J-Pole

There are several ways to make a J-pole antenna. The easiest way is to attach the J-pole's elements directly to the feed line as shown in fig. 1A. One popular version of this design uses 300-ohm twin-lead, ribbon TV cable for the elements (fig 1B). For the two-meter and 440 MHz ham bands, this results in a small antenna that you can roll up and carry in your pocket for travel or for emergency work.

Using the dimensions given by the formulas

below will get you into the right range of frequencies, and the antenna should then work for you. But, if you want to make sure that the antenna is tuned to the frequency for which it is designed, then you should test it with a device such as an SWR analyzer, and trim it to resonance as necessary.

For this approach, be sure to make the antenna something like 5 percent longer than the length which the length formulas give you, so you can trim it to the desired frequency. Clipping short segments off the antenna raises its resonant frequency. By the way, just about any antenna – whether you construct yourself or buy it ready-made – will need adjustment to put it right on-frequency when installed at your particular location. Most of us don't have the necessary test equipment to adjust our antennas to precise length, so it's fortunate that cutting to the lengths given by the formulas usually gives us a working antenna.

In inches:

Length A:  $7884/\text{Freq}(\text{MHz})$ , Length B:  $2327/\text{Freq}(\text{MHz})$

In cm:

Length A:  $20025/\text{Freq}(\text{MHz})$ , Length B:  $5911/\text{Freq}(\text{MHz})$

For instance, length A at 147 MHz would be  $7884/147=53.6$  inches long.

Cut the twin-lead cable as shown in fig. 1B. Solder the shield (outer conductor) of your coax lead-in cable to the short element in the twin-lead, and solder the coax center conductor to the longer element as shown in fig. 1B. Make a small hole in the twin-lead insulation near the

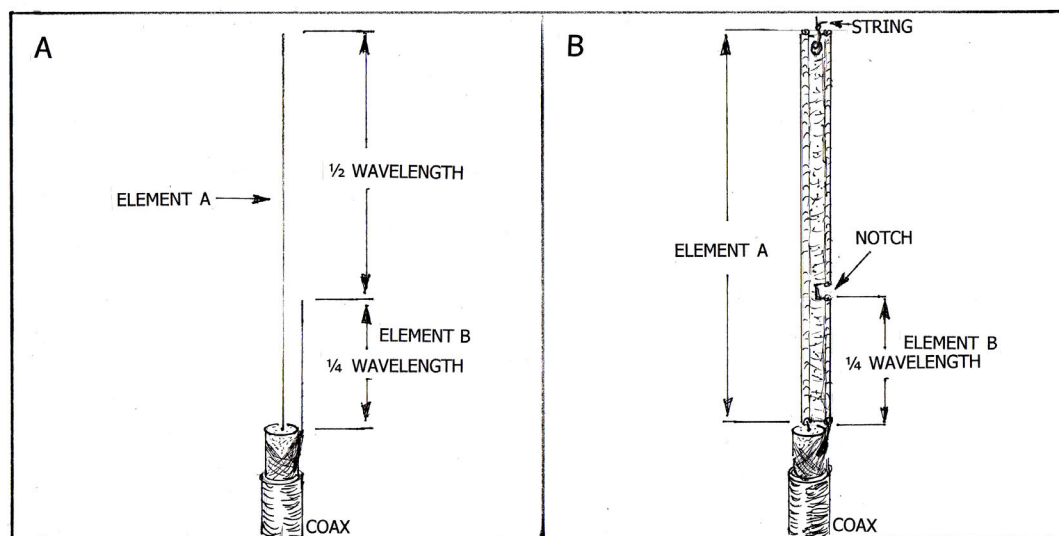
top of the antenna (fig. 1B), and tie a string there for tying the antenna to some high point.

If you will be leaving the antenna outside for extended periods, you should apply some coax sealant where any wire is exposed. For occasional use this isn't really necessary.

The antenna is now ready to use.

### ❖ Using the Antenna

A weight, such as a lead fishing weight, or a rock tied to the mounting string, can be used to get the string over a convenient branch or other high elevation tie point. The higher the antenna is sited the better it is likely to perform.



#### This Month's Interesting Antenna-Related Web site:

Discussion of, and directions for making J-poles for 2 meters through 40 meters: [www.dk7zb.fox28.de/J\\_Pole/wiremanipole.htm](http://www.dk7zb.fox28.de/J_Pole/wiremanipole.htm)  
Site with calculator for finding dimensions for making a J-pole made of copper pipe: [http://aralb.org/Comitees/Technical/J-POLE/design\\_a\\_jpole\\_antenna.htm](http://aralb.org/Comitees/Technical/J-POLE/design_a_jpole_antenna.htm)

Free antenna modeling program with many antenna designs in library. I haven't tried it yet:

[www.smeter.net/antennas/mmana.php](http://www.smeter.net/antennas/mmana.php)

Nice discussion of antennas, their gain, their radiation patterns, etc.:

[www.aerocomm.com/docs/Antenna\\_Tutorial.pdf](http://www.aerocomm.com/docs/Antenna_Tutorial.pdf)

Some practical antenna basics:

[www.electronics-tutorials.com/antennas/antenna-basics.htm](http://www.electronics-tutorials.com/antennas/antenna-basics.htm)

There's a lot of radio info on the following site:

[www.antentop.org/book/bc.htm](http://www.antentop.org/book/bc.htm)

The role of radio in espionage work is exciting reading. This next site has a free book on radio, and the use of radio direction-finding antennas in locating clandestine radio transmitters:

[www.trft.org/TRFTPix/spies9eR2006.pdf](http://www.trft.org/TRFTPix/spies9eR2006.pdf)

I find the web sites such as those cited this month are a great source of information. But we get so much information so easily from the internet that it's easy to forget that ordinary printed books can give us a great deal of information, too. For instance, the *ARRL Antenna Book* is a real

## RADIO RIDDLES

### Last Month:

I asked: "What are 'sky billiards'?" Well, some radio signals, particularly on the high-frequency band, bounce (reflect, or refract) between the earth and the ionosphere several times before reaching the distant station at which they are being received. Some old-time radio communication pioneers thought it resembled the way billiard balls bounce from the bumpers of pool tables when experienced

billiard players make a difficult shot. Thus the term "sky billiards."

treasure house of information on both antenna theory, and practical how-to information on making your own antennas. And when you buy this book, you get it in paper and on a CD. Installing the data from the CD on your computer allows you to have the whole book available as you work at your computer as well as in paper form for you in your armchair.

And so: Obviously, vertical antennas have a lot to offer for radio communications. In an upcoming column we'll discuss another useful vertical antenna, the collinear, or Franklin antenna.

By the way: Although we've emphasized some virtues of vertical antennas this month, I don't want to steer you wrong. Horizontal antennas also have a lot to offer. The horizontal, half-

billiard players make a difficult shot. Thus the term "sky billiards."

### This Month:

In the early days of air travel, the Zepp antenna was developed for use with Zeppelin lighter-than-air craft. When the Zeppelin was aloft, the Zepp antenna was trailed out below the Zeppelin at the end of an open-wire feed line. So what relevance does the Zepp antenna have with regard to the J-pole antenna?

You'll find an answer to this month's riddle, another riddle, another antenna-related web site or so, and much more, in next month's issue of *Monitoring Times*. 'Til then, Peace, DX, and 73.

wavelength dipole has probably supported more communication in the past than any other single antenna design. And there are many other useful, horizontal antenna designs available. We'll be covering some of them in the not-too-distant future.

## Antenna Designer

New Version 2.1 for Microsoft Windows 95 and 98

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## Power for the BC-221

In preparation for firing up and testing our normally-battery-operated BC-221-AL, we need to provide it with power. The power required to operate the heaters of this model is given in the technical manual as 5.4 to 6.0 volts at 0.86 to 0.91 amperes. Plate voltage is specified as 121.5 to 135.0, with the current drain depending on the mode in which the instrument is being used. With all tubes of the instrument operating, current drain is .016 to .018 amperes at the specified voltages. Power requirements for other BC-221 models may vary, but will be similar.

### ❖ Planning a Power Source

As used by the armed forces, four large 1.5-volt dry cells supplied the 6 volts to light the heaters and two 67-1/2 volt "B" batteries in series supplied plate and screen voltages. Common practice in converting BC-221s to plug-in power is to operate the heaters at 6.3 volts a.c. and the plates and screens at 150 volts d.c., stabilized with a gaseous voltage rectifier tube such as the OD3 or a miniature version, the 0A2.

Back when tube technology was king, transformers for building the required a.c. power supply were easily obtained and inexpensive. For the BC-221, one would have employed a small receiver power transformer having a 6.3-volt heater winding, as well as a 5-volt winding to light the rectifier tube that would then have been required, and a high-voltage winding providing maybe 350 volts on either side of center tap for use in a full-wave rectifier circuit.

Many of us, in our "junk boxes," have power transformers that would work. But the prices of new transformers, and even used ones from surplus sources, are discouragingly high. And I don't like to assume that our readers have well-stocked junkboxes. When I started this series of columns in *Monitoring Times*, one of

my aims was to introduce those who had perhaps never worked with the old tube gear to the fun of antique radio restoration.

Actually, by using a voltage doubler type of rectifier, we could get a high enough d.c. voltage (about 300) to operate a 150-volt voltage regulator circuit directly from the a.c. line without a transformer. However, as has been stressed in some of my earlier columns and, more recently, in "On the Bench" for May, direct contact with the "hot" side of the a.c. line can be very dangerous indeed. We need the a.c. line to power our projects, but it is essential that we keep it isolated on one winding of a transformer while we work with the voltages it induces in another.

### ❖ Poor Man's Isolation Transformer

Small low-voltage transformers can still be found at reasonable prices by doing some searching on line. One can create the equivalent of an isolation transformer by using a pair of them with their secondaries connected. Plug one 115-volt primary into the a.c. line, and full, but safely isolated, line voltage will appear on the primary of the other. This can be rectified and regulated as described. Furthermore, if the transformer secondaries are 6 volts, there's no reason why power to light the tube heaters can't be taken from their junction.

Although I very probably have a small receiver transformer that would fill the bill, I decided to go the "isolation transformer" route as an illustration of a practical approach using components readily available to those with no parts already on hand. I happened to have two small low-voltage transformers (purchased from a surplus source), that had been repair parts for a Toshiba tape recorder.

Unfortunately, these transformers have 8-volt secondaries, so I couldn't obtain voltage

to light the BC-221's tubes from them. But they could still be used to demonstrate the isolation transformer principle. I suppose I could have planned to use a resistor to step down that voltage, but instead I'm going to use a separate small 6.3-volt transformer that I also happened to have on hand.

Figure 1 shows the two transformers with their secondaries wired together. The pairs of wires extending out to the sides are the connections to the primaries. Connect either pair to the a.c. line and the same line voltage, safely isolated, will be available at the other pair. Had these been 6-volt transformers, power for the tube heaters could have been taken from across the connected secondaries.

I did some quick on-line research to check on sources for suitable transformers that could be used to light the tube heaters as well as supply isolated line voltage. In the space of a few minutes I found three. Fair radio ([www.fairradio.com](http://www.fairradio.com), 419-223-2196) offers a 6.3V, 1A transformer (#38-6.3V-1A) for \$5.95; Radio Shack ([www.radioshack.com](http://www.radioshack.com)) shows a 12.6V, 1.2A center tapped, unit (#213-1352) at \$8.39; All Electronics ([www.allelectronics.com](http://www.allelectronics.com), 1-888-826-5432) has a 12.6V, 1.2A center tapped unit (#TX121) at \$5.50.

With a more thorough search, you might well be able to find better deals. Of course you will need two of whatever model you choose. If you get 12.6V center-tapped units, wire the full 12.6V secondaries to each other to make the isolation transformer. Then take the 6.3 volts for the tube heaters from one end of a 12.6V secondary and one of the center taps.

### ❖ Rectifier and Regulator Circuits

The circuit of the voltage doubler rectifier and voltage regulator is shown as Figure 2. The approximately 120-volt a.c. output of the isola-



Fig. 1. Isolation transformer made from two low-voltage transformers with secondaries connected (see text).

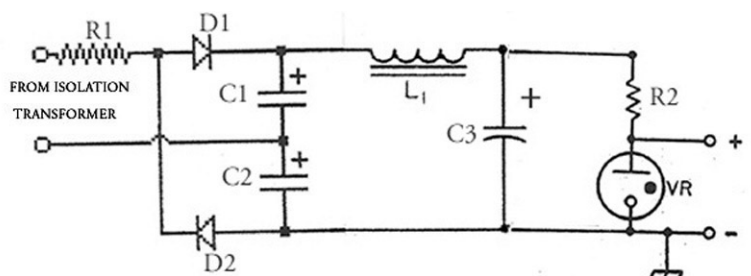
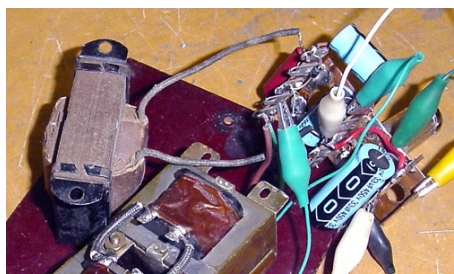


Fig. 2. Schematic of the voltage doubler rectifier and 150-volt regulator circuit.



**Fig. 3.** Rectifier and regulator circuits were built on a salvaged copper bracket. Filter choke will be mounted separately.

tion transformer of Figure 1 is connected at the points marked "From Isolation Transformer."

Resistor R1 is 50 ohms, 5 watts; Diodes D1 and D2 are 1N4005 (600V, 1A—Radio shack 276-1104); Capacitors C1 and C2 are 47 uf, 160V electrolytics; Capacitor C3 is a 33 uf @ 450V electrolytic; Choke L1 is from the junkbox — inductance unknown, resistance 500-ohms. A 5-watt resistor of the same value would probably work; Regulator Tube VR is an 0A2, which is a miniature 150-volt type. The full-size 150-volt version (0D3) could also be used, though mounting it in the BC-221's former battery compartment might be a little tight. Resistor R2 will be discussed below.

Resistor R1 protects the diodes by restricting the otherwise large current flow that would take place during the initial charging of the capacitors when the power supply is first turned on. Diode D1 charges Capacitor C1 to peak line voltage during positive half cycles; Diode D2 charges Capacitor C2 to peak line voltage during negative half cycles. Since the capacitors are in series, these voltages add and the voltage across the pair is about 300.

This is full-wave rectification, so the ripple frequency in the output is 120 cps, or twice the line frequency. L1 and C3 form a conventional choke-input filter. While an in-depth treatment of the action of Voltage Regulator tube VR would be beyond the scope of this article, a few points are worth mentioning.

A voltage regulator tube can be considered to be a resistor that automatically changes its value to maintain a certain specified voltage across its terminals within a certain range of currents. The 0A2 we are working with maintains a nominal 150 volts for currents flowing through it of 5 through 30 mA.

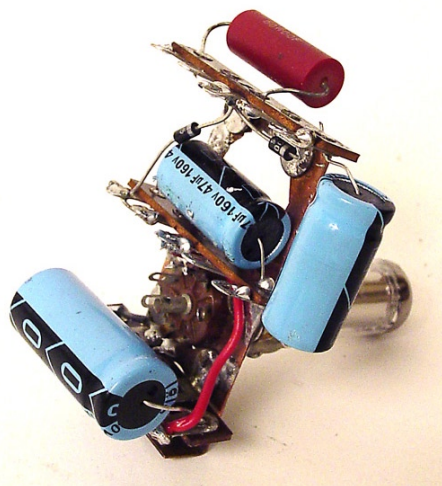
Referring to the schematic of Figure 2, series resistor R2 is adjusted so that the tube draws a current near the upper end of this range — perhaps 25 mA — when there is no load across it. The load to be regulated, in this case the d.c. input of our BC-221, is connected in parallel with the tube (across the terminals marked "+" and "-"). The more current that is drawn by the load, the less passes through the tube. But as long as the tube current does not drop below 5 mA, it will continue to maintain 150 volts across its terminals.

### ❖ Power Supply Construction

The circuits were built up on a small bracket made of roofing copper, that was salvaged from another use. Already mounted on it was a 7-pin miniature socket that could be used for the 0A2

regulator tube. I added three strategically-placed terminal strips on which to wire the simple voltage doubler and regulator circuitry, installing them by the simple expedient of soldering their mounting lugs to the copper surface.

Because I would have to experiment with the value of resistor R2, I didn't solder it in place, but connected it to the circuit via temporary clip leads. The wiring was arranged so that when R2 was permanently installed, each side of its connection to the tube would be made to a separate terminal lug. During testing, a d.c. milliammeter could be connected across the lugs to check the current through the tube. Before permanently installing the power supply in the BC-221, they would be shorted with a small jumper.



**Fig. 4.** Power supply lashup was definitely not too pretty, but allowed me to conduct initial tests prior to final assembly.

In its final form, the power supply will be assembled by surface mounting the transformers, the filter choke, and the bracket holding the rest of the circuitry to a rectangular base made from wood or other insulating material. The base will be fastened in place inside the BC-221's battery compartment.

However, I was reluctant to mount and wire the components until final tests could be completed. And so I laid them out in a temporary arrangement and virtually exhausted my supply of short clip leads to connect them with each other and the BC-221 (Figure 4). As already mentioned, the tubes of the BC-221 would be lit with a separate small filament transformer, also temporarily connected.

Through experimentation, I found that a 2,000-ohm resistor at R2 resulted in a no-load current through the regulator tube of approximately 25 mA — which is reasonably close to the top of its operating range. At that current, the resistor dissipates a little more than a standard 1 watt resistor can handle, so I used a 5-watt unit I had on hand.

### ❖ Smoke Test

I plugged in the standard HS-30 military headset specified in the manual (any high-impedance unit will do) and connected the power supply and filament transformer, along with meters to monitor the voltage across the load and the current through the regulator tube.

By the way, the BC-221 heaters cannot normally be turned on until the headset plug is inserted, actuating a switch. In military service, this prevented the user from closing up the instrument and putting it away with the tubes still lit — thus running down the batteries. The previous owner of our instrument had disabled this feature by shorting out the switch.

Turning on the heaters, I set the mode switch to the "XTAL CHECK" position. After warmup, I noticed that the current through the 0A2 had dropped to 7 mA, a reasonable amount above the 5 mA lower operating limit. Putting on the headset, I slowly turned the "CORRECTOR" knob and was pleased to bring in a heterodyne note — proving that both the crystal and internal VFO were operating as was the audio amplifier stage.

Next, I moved the mode switch through all of its positions — which selectively connects the stages of the instrument in various combinations, varying the load presented to the power supply. And, though I could see the effect of these changes in the current through the 0A2, I was pleased that the supply voltage did not vary by more than half a volt (running from about 149.9 to 150.4).

I had been a little concerned, because R2 should, ideally, be on the order of several thousand ohms, and one manual states that 3,000 ohms is the bottom limit for good regulation. But I think I am getting away with the 2,000-ohm unit because of the BC-221's very small current draw. Next month: final assembly and testing.

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## Sangean WFR-20 Wifi Radio

### Pick your own Programming

**A**s I type this review, I'm listening to the crisp brass of Tchaikovsky's *Capriccio Italien* emanating from the two 3" stereo speakers in a small desktop radio. But this radio is something quite different from what I'm used to; its wireless interconnect feature has linked it to the Internet through my host computer from a distance of up to 300 feet, allowing me to visit hundreds of classical music broadcasts at any one time, and countless other stations and stream sources throughout the world.

You don't even have to have a computer; it can be used as a stand-alone receiver working into a broadband Internet connection and a wired or wireless router.

The radio is from Sangean and it's the WFR-20, their new WiFi Internet radio. Its sleek, black cabinet with one dial belies its multi-functional capability. A touch of that dial allows many menu choices, and a tiny infrared remote control makes the tasks even easier.

This little radio with big sound offers a menu with options of some 60 genres of music including favorites like jazz, flamenco, folk music, classical, rock, new age, rap, country, bluegrass, Christian, blues, hip hop, Latin, oldies, and many more. Talk radio, sports broadcasts, news, interviews and other non-musical programs are also available at the touch of the dial.

You can search for these stations with the radio or you may use your favorite web browser and upload them to be filed in the "My Stations" folder. Many of these stations offer a choice of "Live" (current broadcast) or "On Demand" (previously-broadcast) sources, the latter of which can be fast-forwarded or fast-reversed.

It is estimated that there are currently more than 20,000 active Internet radio stations and audio stream sources available. These are registered for your reference on the Reciva portal website: [www.reciva.com](http://www.reciva.com). By registering with Reciva, the listener may configure his WFR-20 to access an enormous database of stations and streams of his preference, effectively increasing the radio's initial 12-channel memory substantially.

Internet radio is like listening to satellite XM or Sirius, but with an astronomically larger selection, and without a monthly fee! Granted, the satellite feeds are available to portable and mobile radios wherever they roam, while Internet radio still requires the computer connection.

#### ❖ Features

The WFR-20 supports MP3, WMA, WAV, AAC, AIFF, FLAC Real Audio, and AU formats. A choice of display languages is user-selectable. A clock/sleep/timer/alarm is yet another functional selection, adjustable for 12 or 24 hour format.

And, if you'd like to use the WFR-20 to access your personal digital media library via your wired or wireless networked computer, you can select Windows™ Media Player™ using the radio's UPnP Server, or optionally call up your Microsoft™ Shared File Folder function using any of the formats listed in the paragraph above. Your computer's hard-drive-recorded programs can be fast-forwarded or fast-reversed by a simple click of the remote control.

Sound quality on the Sangean is quite good for a table radio. A single dial controls volume, bass and treble, as well as station and mode selection.

The three-line, backlit LCD display is easy to read, and provides all the programming information as it is manipulated either by the dial or the remote control. After the station is selected, the display automatically announces the station along with the contents as provided by that specific program.

Since starting this review, I've switched channels. Right now the scrolling display is telling me that I've selected AccuRadio Classic Crossover, and I'm listening to Alfred Brendel's Sonata No. 3, Opus 53 D. 850, 2. con moto, and that Real is enabled at 64 kbps in MP3.

The multilingual display vocabulary may be selected from any of 11 different languages.

The display offers a wide viewing angle of large characters, and brightens when the dial is pressed or turned to make an adjustment, dropping back to a softer glow when simply scrolling its information. The backlight dial may be adjusted for brightness levels to suit the user.

*What distinguishes the new wifi radios isn't their hardware – it's what you can hear on them!*



The WFR-20 is powered from AC; internal audio power to its speakers is 5 watts per channel, available for optional external speakers or a set of headphones from rear terminals. To feed the receiver's audio to an external amplified stereo system, a stereo line output is also provided. Both audio sources employ standard 3.5 mm (1/8") jacks.

There is an additional 3.5 mm input jack for allowing the radio to accept an external audio source with two different programmable sensitivity choices to accommodate high or low input levels.

Its WiFi connection is supported by both 802.11 b and g, or the user may wish to utilize a direct LAN (Ethernet) connection (cable included). The radio measures 11-1/2"W x 4-1/2"W x 7-1/4"D.

As with all digital equipment, future upgrades are inevitable. Any such upgrades for the WFR-20 may be accessed on line via the Configure menu item.

#### ❖ Internet radio peculiarities

One annoying characteristic of Internet Radio is the capricious nature of some program sources; you may be listening to your favorite music and suddenly it's switched to another piece. Or the buffering of the incoming data is choked by the connection and you experience frequent audio dropouts during your favorite passages as it catches up.

Not all programs announce their program content, so it may be impossible to identify what you're hearing without having access to their program schedule. And finally, not all channels are active all the time.

Switching through the memorized stations is not rapid; it may take anywhere from a few seconds to nearly half a minute for the radio to load on each newly-selected channel.

#### ❖ A final note

Internet Radio is just one more staggering achievement in the evolution of the worldwide web. It offers the potential to draw divergent civilizations closer together. And what better way to do it than with their music and their voices? *MT* will continue to bring you Internet Radio programming information in regular installments. Stay tuned to the *GlobalNet* column!!

The new Sangean WFR-20 WiFi Internet Radio is in the \$300 price class and is available from *MT* advertisers.

## Using Diamond Cut 7 – Part 2 Live Audio Clean-up

By John F. Catalano

**A**s we saw last month in Part 1, Diamond Cut 7 (DC7) is an audio restoration program suite that can really clean up audio recording. Using DC7, noise and background hum alike can be dynamically filtered out. Then, using other DC7 functions, the resulting audio can be further enhanced, digging it right out of the “dirt” and making the recorded audio very intelligible.

But, DC 7 claims to be able to work its magic on live audio signals from our receivers in real time. No recordings here! Is this possible? Can we really take a live signal in the mud of atmospheric noise (QRN) and signal fading and move it from un-intelligible to intelligible? In Part 2 we will attempt to answer these questions.

### ❖ Quick Review

DC 7 has three basic parts: first is digitizing the analog audio signal. Next, its many, many functional blocks that the user can string together to perform very complex audio functions in the digital domain. And finally, DC 7 returns the digital audio to analog so we can hear it.

Sounds simple, but as we saw in Part 1, the eight hundred or so functional filter blocks that DC 7 provides can do virtually anything to recorded audio, if we take the time to learn how or if we are audio experts. DC 7 also provides easy to use “canned” routines for us casual users that choose the correct function blocks for our required application.

### ❖ Hardware Required

DC 7 runs on Windows XP with the SP3 update and 512 Mbytes of RAM, or Windows Vista with 1024 Mbytes RAM. For XP users, DirectX 5.0 or higher is required. A full duplex sound card that can record and play at the same time is essential.

We'll use the same Toshiba A135-S2276 laptop with a 1.6 GHz Duo Core T2060 CPU, 2048Mbytes of RAM and a Vista Home Basic operating system. One difference from Part 1 is that we have now installed the SP 1 upgrade to the Vista OS. To date, I have found no problems with previously installed programs running under Vista SP 1.

### ❖ Receiver Hardware

Any shortwave receiver or scanner audio output will work. We will use the audio output of the venerable Icom IC-R71 shortwave receiver. The R71's front panel Line-Out jack is connected to the PC's audio card's Line-In.

### ❖ The Multi-Filter

Okay, so now that we have audio, what is the easiest way to use DC7 to filter the audio? The answer lies in the use of the DC 7's Multi-Filter, see Figure 1. This function allows the user to “stick together” any of the filters included in the program. But DC7 does not stop there. The user can choose the sequence in which the filters are used simply by dragging and dropping them into the order we need. Each filter section can then be customized to our specific monitoring conditions.

We can hear the effect of each individual filter section on the signal by using the filter's “Preview” button. In a similar manner, we can hear the effect of the whole string of filters via the Multi-Filter's “Preview” button.

DC7 provides users with a number of ready-made multi-filters. The Multi-Filter that we created, shown in Figure 1, is very simple, having only three filter sections. We have tailored each filter section and saved the result as “C&R SW Off Air Filter 1.” Let's look at each section in our simple Multi-Filter.

### ❖ Starting at the Beginning

All the files mentioned in this article can be found at [www.monitoringtimes.com/mt-subscriber](http://www.monitoringtimes.com/mt-subscriber) (required password found in current issue) and you may listen to them with Windows Media Player or any audio player capable playing “.wav” files.

Start by playing our original, live, off air signal, **OFF\_AIR\_Orig.WAV**. You can hear that this signal has two severe problems: high and varying background noise levels and signal fading due to propagation. Not easy problems to solve. In fact, where the signal has faded below the noise, no program, not even DC 7, can do the impossible and recover the audio. Perhaps we can make parts of this signal very difficult signal more “listenable.”

The first filter section seen at the top left of Figure 1 is the “BandPass1.” The “1” denotes that this is the first filter section of our multi-filter. If we double left-click on the BandPass filter, Figure 2 is displayed. From here we can adjust the filter's parameters. In the BandPass filter we will try to remove some noise signals outside the speech range

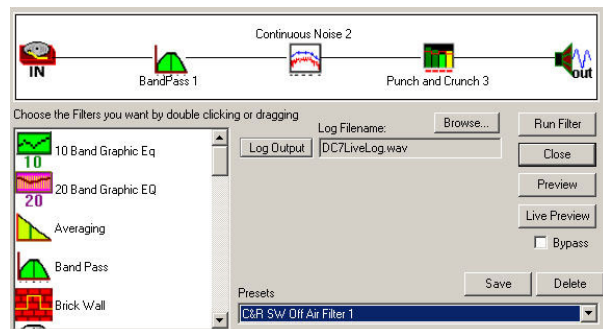


Figure 1-2 Diamond Cut 7 (DC7) Multi-Filter that we customized for live shortwave monitoring.

of frequencies.

I used an empirical method of adjusting the slider controls and then listening to the result via the “Preview” button. This was repeated a number of times until the resulting signal sounded the best – not easy with an ever-changing live off-air shortwave signal. But you can get a good result after a few tries.

### ❖ Noise and Lots of It!

In the next filter section we will try to filter out more noise. The Continuous Noise filter is one of the most important in cleaning up SWL signal.

The User Manual's tutorial on this filter suggests the following set-up procedure, followed by spending “... about an hour playing around with it in order to become familiar with its behavior.” To give you an idea of the filter set-up procedure, below is an abbreviated version of what is described in the DC 7 User manual.

#### Continuous Noise Filter Procedure (condensed by J. Catalano)

1. Highlight a quiet portion of the Source .wav file.
2. With the left mouse button, click on “Filter.”
3. Next, click on “Continuous Noise.”
4. When the Continuous Noise Dialog Box ap-

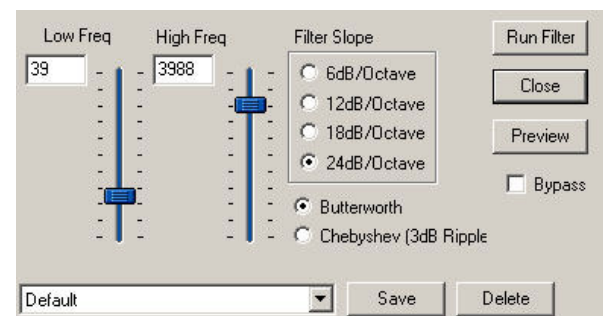


Figure 2-2 Customizing the Bandpass Filter to our conditions.



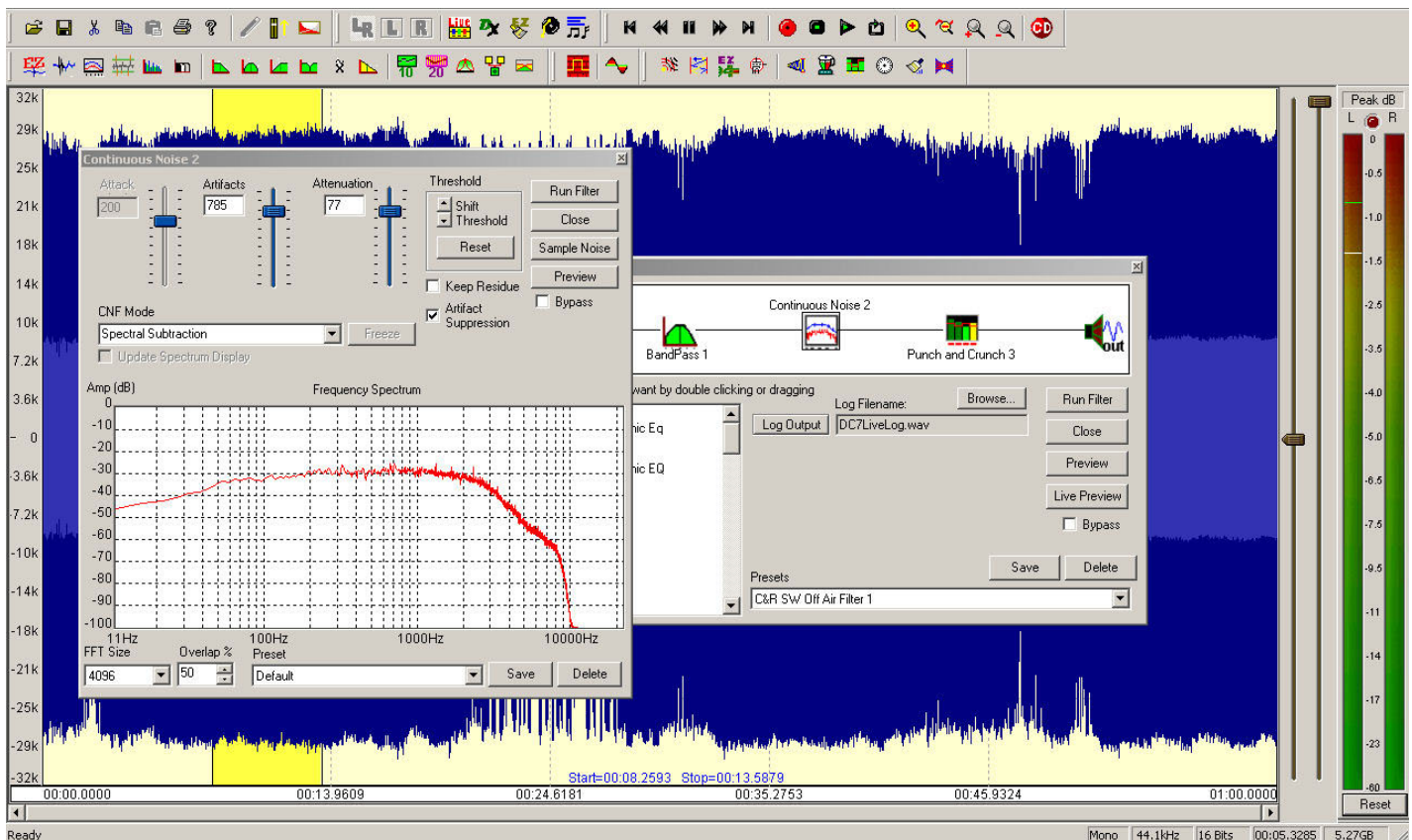


Figure 3-2 The Continuous Noise Filter hearing and learning our signal

- pears, click on "Sample Noise."
5. A graph will appear showing the Amplitude (in dB) versus the Frequency of the .wav file noise floor.
6. The measured sample noise spectrum is shown in red. The noise threshold value vs frequency is in blue.
7. To change the graphical threshold contour, follow the procedure outlined in steps 7 through 10. Using your mouse, place the pointer on the left-most blue threshold marker on the graph (one of ten blue dots).
8. Depress the left mouse button and move the dot either up or down so that it remains somewhere above the red line graph at the bottom end of the spectrum.
9. Move the next blue threshold marker just to the right of the first one, and using the mouse, set it somewhere above that particular frequency on the spectrum graph.
10. Repeat process until all ten threshold markers are located somewhere above the "noise floor" graphical representation of your .wav file. The blue line should be located above the red line at all frequency locations. The best contour can only be achieved by moving both the markers along the vertical axis and the horizontal (frequency) axis.
11. Set the "Attack" time initially to 25 milliseconds.
12. Set the "Release" time initially to 50 or 100 milliseconds. (The "Release" time constant should always be set longer than the "Attack" time constant for a realistic sounding operation of the filter.)
13. Set the "Attenuation" control initially to 10 dB. (Higher numbers results in higher levels of noise reduction.)
14. Highlight the portion of your .wav file on which you desire to apply the Continuous Noise Filter.
15. Run the Filter.

16. Play the section that you have just processed, and determine which parameters need modification.
17. When you are satisfied with the results, re-run the .wav file

As you can now appreciate, although DC7 has many pre-loaded filters and multi-filters, special situations require time and effort for good results. Figure 3 shows our Continuous Noise filter in the process of being set up.

### ❖ Punch & Crunch

This describes what I feel like I've been through after writing a piece on a complex topic! But in this case it is also the name of the DC7 filter that tries to compensate for the wild signal fading on our signal. As we said, realistically no software can recover audio that just is not there! And for part of our signal, the fading is so severe the signal is gone completely.

Figure 4 displays the P&C filter in operation. Notice that we have broken the audio into four distinct frequency bands: 0 to 294 Hz, 294 to 2454 Hz, 2454 to 6932 Hz and 6932 and higher. The red lines indicate at what level the "Expander" or amplification will take place.

Since most human voice lies in the frequencies between 300 to 3000 Hz the red line has been set at zero in this range. This means that expansion/amplification takes place at all input levels for these frequencies. The effect is to amplify the voice frequencies, leaving the noise frequencies behind at a lower level.

Now that we have the all the filter elements set up for our terrible shortwave

monitoring conditions, we can do some live off air listening with DC7's assistance.

### ❖ A Tough One

You can hear the results for yourself. Listen again to the unfiltered signal at the above *MT* link. Now go to **OFF\_AIR\_FILTERED.WAV** and listen to the resulting multi-filter signal. Then judge for yourself. I think you will find parts of the filtered signal have been greatly improved, while others parts are just asking the impossible.

We can see the results in Figure 5. The top graph is the off air input signal. Notice the wide horizontal area in the center of the graph. This is our signal with all of its noise.

Now take a look at the bottom graph. Notice that the broad wide swath is gone, replaced with spikes, which in most cases corresponds to voice

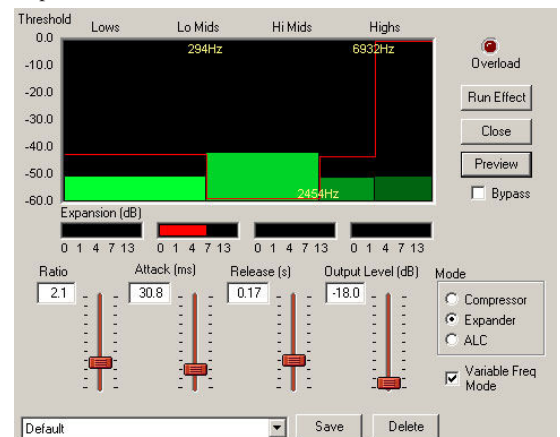


Figure 4-2 Punch & Crunch Filter. Notice the four distinct audio bands we have created

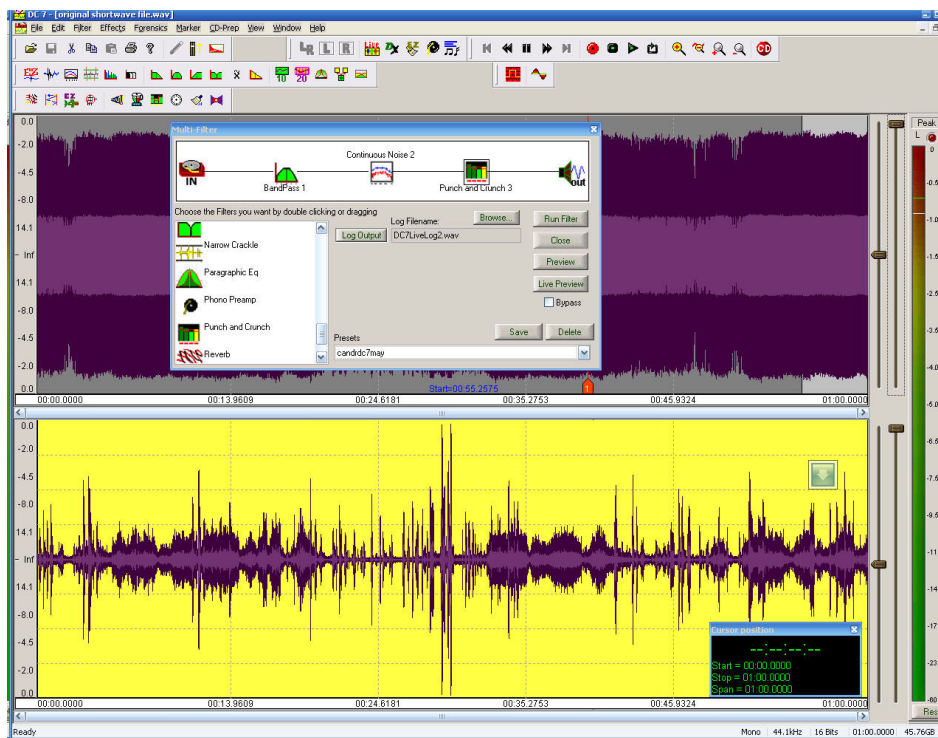


Figure 5-2 Seeing is believing! Top graph is as received off air. Bottom is put through our Multi-filter. Notice the "thinning" of the bottom trace.

modulation. However, where the signal fades completely, relatively wide regions are visible. Since the voice signal is gone, the program is trying to still find and expand it. The result is amplified noise.

### ❖ A Fair Chance

Again, the signals we attempted to clean up had high levels of noise (QRN) and deep signal fading, a very hard combination of problems. The current shortwave conditions are some of

the worst I have experienced in my 45 years of SWling! However, no one can ever accuse this writer of choosing examples that make his job easy.

But to be fair to DC 7, let's see what it can do with the very hard, instead of the impossible. We have made a file of just the last part of the intercept. This is the part that has a male announcer with lots of noise on top of him. You can hear the original **MAN\_ORIG.WAV**

Now listen to **MAN\_Filtered.WAV**. I think you will agree that DC7 really cleaned up this signal and made it listenable. You can listen to a third example of "before" and "after" files by listening to **EX2\_Orig.wav** and **EX2\_Filtered.wav**, respectively.

We found that DC 7 operated the same when used on live audio or audio files. However, slower PC processor may cause these two modes to operate very differently.

### ❖ Precious Gems

Diamond Cut 7 can be downloaded from [www.Enhancedaudio.com](http://www.Enhancedaudio.com) for the price of \$159. Or call toll free 866-260-6376 to order over the phone. An excellent training DVD, which walks the user through many uses of DC 7, is available. A download bundle of the DC7, PDF help file, plus a mailed training video (no charge for shipping) is available for \$188.

If you do any music restoration, DC 7 is a must. For voice and monitoring applications, with reading, practice, and patience, DC 7 can yield very good results for both "live" and stored audio.



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## Kick the Headphone Habit with Bluetooth

By George Tasson

**R**adio enthusiasts are always looking for a way to make their hobby enhance their listening pleasure. I retired several years ago after 32 years in the communications industry. While I'm not a ham, I do enjoy going to hamfests and flea markets. Like a lot of folks, I've got radio in my blood.

I have always been an active radio monitor. As a youngster, I built a crystal radio set and couldn't believe the thing actually worked. Free radio, without a battery! I was hooked. Later on as a Boy Scout, I built a one-tube radio with a long wire antenna and headset. That one had better selectivity than the crystal set, but needed "A" and "B" batteries.

Living in the Chicago area in the early '60s, one could hop on a bus and go to Allied Radio at 100 N. Western Avenue. Olsen Electronics was across the street, and between the two of them I could walk around and just look for hours. You name it, they had it. I didn't have time to get into trouble; I was too busy trying to figure how things worked, and chasing electrons.

Back then you had a good selection of radio and electronic distributors. Allied Radio had Knight Kits. Heath Electronics out of Benton Harbor, Michigan had Heath Kits. Lafayette Electronics out of Syosset New York had a whole bunch of things to build. All a kid had to do was figure out how he was going to earn enough money to support his habit. All these guys would even send you a nice thick catalog so you could leave it lying around the house and drop hints of what you wanted for Christmas or your next birthday.

While I was in high school I built an aircraft down-converter. This was a device that allowed you to listen to the aircraft band on an AM broadcast radio. When I was in the service I was the only guy in the squadron that knew when our planes were coming in, because I could hear the aircraft talking to the tower many miles out.

### ❖ Still Hooked

Like many of you, I'm always going somewhere with a radio, scanner, CD or MP3 player with a headset on. The headset can be a big inconvenience. The wires catch on things, get broken, and become intermittent. With the advent of cellular portable handsets and the big push for hands-free operation, it's not uncommon to see folks walking around with a Bluetooth headset over one ear.

After some trial and error, I hit upon a combination of equipment that will allow one to stream scanner audio to a Bluetooth headset.

The Jabra A120s is a Bluetooth music adapter with a 3.5mm audio plug. This unit comes with USB charger cable for charging from a PC or laptop, a Velcro(R) pad for attaching to a music player or radio, and a user manual.

The Jabra A120s is capable of streaming music for 10 hours. It has a rechargeable battery, which can be charged via a PC USB connection.

**Operating range 33 feet (10 meters)**  
**Supports Bluetooth specification 1.2**  
**Supports Advanced Audio (A2DP) stereo audio streaming**

**Remote Control (AVRCP) for mute function**

I have used the Jabra A120s music adapter with the Jabra BT620s over-the-ear stereo headset, and the BT8010 stereo headset with ear hook. The BT8010 can be used as a mono headset over just one ear and will look just like a typical cellular telephone user while you are actually listening to your scanner. Both headsets support volume control and muting functionality and come with chargers.

### ❖ Bluetooth Pairing

In order to establish an initial encrypted communication link between the music adapter and the headset, you must pair the devices. Make sure you read the manual and follow the manufacturer's instruction sequence for pairing. Once they are paired, you simply turn them on and off for normal operation.

How does it work? First and foremost, charge the Jabra A120s adapter and BT8010 or BT620s headset until they indicate that you have a full charge. This should give you 8 to 10 hours of Bluetooth operation. It is important to set the volume on your source device (scanner) to the lowest possible level to prevent distortion, then adjust the headset volume to a comfortable level. Do not use this equipment in a high ambient noise environment.

Make sure your scanner batteries are charged up and ready to go.

I used this equipment with a Uniden BCD396T and a Radio Shack PRO83. Both of these scanners support the 3.5mm stereo plug

from the A120s music adapter. Older scanners that only support the 3.5mm mono plug will need a mono to stereo adapter. I did not test this configuration.

### ❖ Bluetooth in Use

What problems did I encounter? CD and MP3 operation was straightforward and worked just fine. You just need find a convenient place to Velcro the A120s music adapter to your equipment. Even though the Bluetooth range specification is 30 feet (10 meters), I would recommend that you place the A120s and the headset on the same side of your body.

When you get into the radio environment, you may have to play around with placement of the Jabra A120s' proximity to your receiving device. The Jabra A120s comes with a 4-inch coiled cord terminated with a 3.5mm stereo plug. You may need to extend this connection to move the A120s away from your receiver. You can use an inline 3.5mm male to female extension cable.

My AM radio worked just fine when I was able to achieve 6 to 8 inches of isolation. I didn't notice any signal degradation or interference while using either the Uniden BCD396T or Radio Shack PRO83 scanner on UHF or VHF high band frequencies.

If you want to use another manufacturer's Bluetooth headset, make sure it supports the A2DP (Advanced Audio Distribution Profile) and AVRCP (Advanced Video Remote Control Profile). The Jabra A120s music adapter is limited to the mute functionality only.

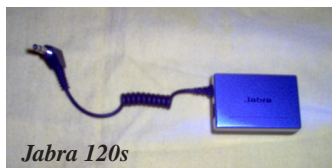
### ❖ What's the Cost?

Street prices: Jabra A120s \$25.00; Jabra BT8010 \$29.00-\$79.00; BT6020 \$29.00 \$59.00. Shop around. With sales, rebates and the Internet, I was able to get set up and going for \$55.00.

Pleasant listening!

### VENDOR INFORMATION:

Fry's Electronics, [www.frys.com](http://www.frys.com),  
877-688-7678  
Tiger Direct, [www.tigerdirect.com](http://www.tigerdirect.com),  
800-800-8300



Jabra A120s



Jabra BT620s



Jabra BT8010





# Using WorldStation V4.2, Part Two Multiple Radio and Remote Operations

Last month in Part 1 we posed the question, “With all the radio application freeware available, are there radio programs out there worth buying?” In an attempt to answer this question we picked a commercially available program, WorldStation version 4.2, as a test case. Last time we saw WS in action on our TenTec RX-320, it was quite impressive! See MT June 2008 for the complete details.

One of WS’s biggest features is its ability to handle multiple radios, both locally and remotely. So this time we have our work cut out for us. How will WS perform in a multi-Radio environment? Will it really allow us to control and listen to our home receiver via any Internet computer? Will it live up to its marketing? Will it take a PhD in science or engineering to operate it?

## ❖ Quick Recap

Instead of running from a single locally executable file, Dxtra’s WorldStation takes a different Client/Server approach. This allows WS to perform many of the functions we will look at this time. WorldStation requires very little in the way of PC hardware, but does a lot with it. In addition to full radio control, WS includes features such as integrated internet frequency databases, built-in custom databases, Chat server, voice response to commands, many methods of receiver tuning, scheduled radio reception and recording, scanning modes, and audio streaming, to name a few. Again, see Part 1 for more details.

## ❖ Multi-Radios – Simple Power

Although we have seen WS work easily and smoothly controlling a single radio, its elegance and sophistication is highlighted in a multi-radio (up to 10 radios) environment. We added an Icom R75 as our second radio, but, since we only have one serial port on our PC, it was connected using a USB to serial converter.

If a second radio client program has been purchased from Dxtra, clicking the Client program a second time will display the command screen for the second radio, with its associated Chat and Conference server windows. In our case, these are labeled at the top left corner “WorldStationTM 4.2/ ICOM R-75.” Figure 1 displays both the RX-320 and the R-75 control panels. Their other associated windows have been minimized as seen at the lower right of Figure 1-2.

Dxtra has come up with an extraordinarily simple method of controlling multiple receivers. Navigate over to the box on the right of the “Welcome to WorldStation™” in Figure 1-2. Currently

“B<>N” is displayed. From this seemingly simple box we can:

Control receivers independently.  
Allow one local receiver to act as Master and other local radios to act as slaves replicating the controls of the Master.

Allow one local receiver to act as Master and other networked and local radios to act as a slave replicating the controls of the Master.

Slave any/all of our local radios to a networked radio being controlled by another person.

The operation to be performed is simply chosen from the dropdown menu, accessed from the right side of the box on each receiver control panel.

In Figure 1-2 (on the bottom control panel) we have set this box to read “A>B”. This makes the RX-320 the Master, sending its commands to radio B, our R-75.

We can see that the R-75 in the upper control panel the box has been set to “B<>N”. This means the B radio sends data to none of the other radios, but it’s listening. So whatever frequency is selected on the RX-320, it will be automatically set on the “listening” R-75.

I tried quite a lot of control combinations between the RX-320 and the R-75. All worked quickly and perfectly without any problems.

## ❖ Really Reaching Out

If you think controlling multiple radios connected to the PCs serial ports is a trick, then you will be very impressed with how easy it is to link up radios via the Internet.

Notice the open box at the lower right of Figure 1-2. Here we can see a list of all the WS windows that are open and contain useful information and features. As you can see, there are three windows for each radio – Control, Chat and Conference – for a total of six windows for our two radios.

The Chat windows allow the user to chat with any other WS users currently on-line. It provides a nice forum for users to discuss and expand their WorldStation experience.

But the Conference Window, Figure 2-2, is where you get a chance to really expand your monitoring reach. Each line represents a radio that is currently on-line with the WS server. Right clicking on a listed on-line radio produces a menu of connection options, including:



Figure 1-2 Displaying the WS control panels both local radios – RX-320 Master (Bottom), R-75 Slave (Top)

Tracking this radio’s frequency changes  
Tracking this radio’s frequency and mode changes  
Turn off tracking  
Visit this client (station’s) location using Google Earth  
Send a Private Message to this ID  
Update Station Name  
Add a Comment

There are lots of possibilities here. One of them gives you the capability of slaving your local radio(s) to a far away receiver. It is also possible in some cases to take control of a network radio, making it a slave of your radio. Talk about diversity reception! The top area of the Conference window, Figure 2-2, allows the user to control their receiver(s) without having to pull up the control panel window and more.

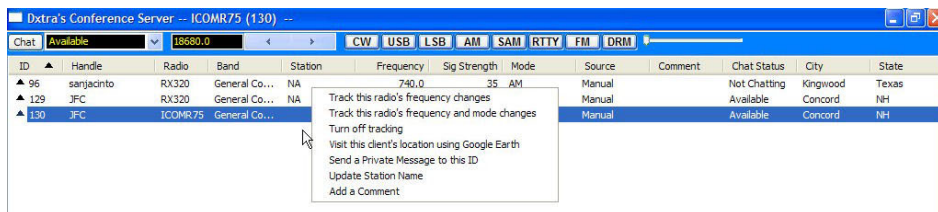
As with all WS operations that I tried, the multi-radio features worked smooth, quick and flawless. No crashes, no missed commands, no “now what?!” Just smooth operation!

The local radio control was perfect, as was the Internet control. The Internet control worked so well that there was no noticeable difference between controlling local or Internet radios.

## ❖ Sit Back and Listen

One of my favorite uses of the multi-radio feature is based on my laziness. Start by implementing the WS scanning feature on the main radio in the standalone mode. When an interesting intercept is discovered, it can be cloned to the second receiver for prolonged detailed monitoring. This frees up the main receiver, allowing it to continue searching/scanning.

Two radios and WS with all of its scanning, scheduling, audio recording and multi-radio



**Figure 2-2 WS Conference Server windows which enable remote controlling of receivers. Notice our two local radios in New Hampshire and one on-line radio in Texas.**

features, makes for a very powerful listening station that can be accessed from anywhere via a laptop and the Internet. Such capabilities were unimaginable for the non-government monitor a decade ago!

## ❖ Now Hear This

A very comprehensive MP3 audio file-handling module runs the audio gamut from scheduling receiver recording, file tagging, playlist generation to audio streaming. Worldstation's "Schedule Table" function allows the user to schedule program recordings via a built-in calendar where the target date and time is set. Much like a DVR, the user can set one-time-recording or repeat recording by day, time and day of week.

The resulting MP3 files are ID3 tagged by WS and therefore contain Title, Author and Track information. When Windows creates a playlist, this information will be displayed, making for easier file identification and retrieval.

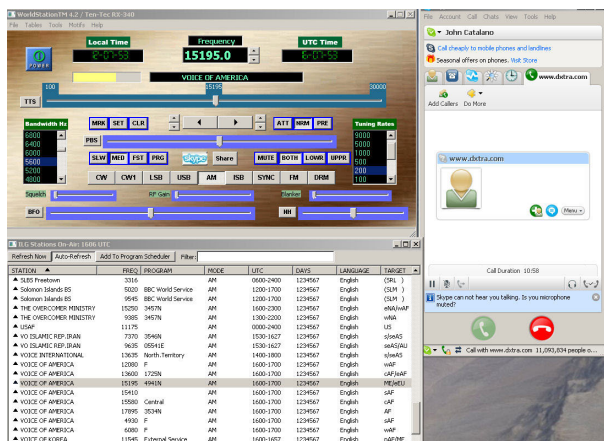
## ❖ Control from Anywhere!

Section 5 (part 3) of the WS 4.2 User Manual gives a step-by-step procedure for setting up your home station so it can be remotely controlled over the Internet. Basically, all you need to know is the "IP address" of your computer. You will have to download and install a free program called Skype.

The Yahoo WorldStation group has an easy to follow networking tutorial, which is a must for anyone setting up a remotely controlled radio that is connected to the Internet via a network.

Figure 3 shows the WS control screen on a laptop remotely controlling a TenTec receiver. As you can see, using the "ILG Stations On Air" table seen at the bottom of Figure 3, we have tuned our remote "home" receiver to VOA on 15195 kHz.

You may have noticed that things look a bit different than they did in Part 1 of this article.



**Figure 3-2 Controlling and listening to a receiver remotely**

Well, as with any good program, in the interim, WS 4.2 has been revised and features added. For example, now there are smaller up/down arrows on both sides of the large main tuning arrows in the center. These smaller arrows can now be used to set the Bandwidth and Tuning Rates without having to move the cursor to the ends of the screen. So where's the audio?

## ❖ Listen from Anywhere!

Okay. We can control our receiver remotely, but how do we listen remotely to what we have tuned to? The answer is Skype.

Skype is an audio over-the-Internet application owned by eBay since 2005. For this use, it can be downloaded at [skype.com](http://skype.com) and be used for free. It installs simply and quickly and it worked perfectly with WS.

Skype is used at both ends of the link. At home it takes the receiver's audio and puts it on to the Internet. And at the "traveling laptop" side, Skype pulls the audio from the Internet to our laptop speakers, all without a hiccup.

You'll see a button labeled Skype in Figure 3 below the long tuning slider. Once you have Skype installed on your PC, clicking this button will automatically stream your receiver's audio onto the Internet. You can see the Skype connection window opened on the right side of Figure 3. Once set up, the remote features of WS work as advertised.

The only problem I encountered was not with WS, but with AVG Spyware. When running, this program slowed down WS's operations by a factor of at least three. This was easily remedied by shutting down AVG.

One more thing: for proper shutdown remember to exit WS via the control panel's "Power" button.

## ❖ My Two Cents...Now a Nickel

If you read both parts of this article, it will come as no surprise that I think WorldStation V4.2 is an excellent program with a compendium of features not found in other radio programs. It worked flawlessly, easily, and was very enjoyable to operate.

By the time you read this article, the on-line User Manual (currently titled v 4.1) should be updated to reflect all the work and changes that have gone in to version 4.2. I would also suggest that Dxtra adds another level of version labeling, i.e. version 4.2.XX so that users can be sure of what version they are running.

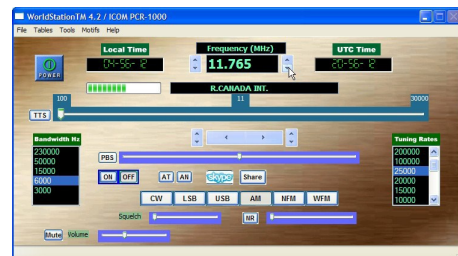
After this article was written, we received yet another new World Station v4.2. In it, Dxtra has added the popular ICOM PCR-1000 to its list of supported receivers, as promised. After using it for four hours, my impression is that it works great. In fact, even after doing two columns on the World Station program, I am still discovering more useful functions!

Figure 4-2 is the control panel of the latest WS 4.2 operating the PCR-1000 in the shortwave spectrum. However, I found WS 4.2 agile and useful in the VHF/UHF bands as well. The key for scanner people is using the "Memory/Logging" function. Accessed via the "Tables" main menu, this function enables scanning of saved frequencies. Of course, the save and scan function also works for shortwave.

So now, WS may be used with TenTec radios, two Drake radios, along with the Icom R-75, and the Icom IC-R1000. If Dxtra continues to create drivers for more radios, WorldStation could very well become the ubiquitous radio control program standard.

A live demo is available on the Dxtra website. Make sure that your receiver is compatible with WS. Bob at Dxtra is listening, so if enough of you ask him to support a new radio, they just might. In any case, tell them you saw it in *MT's Computers & Radio*.

WorldStation V4.2 is downloadable from [www.dxtra.com](http://www.dxtra.com) for \$80 with one client included.



**Figure 4-2 WSv4.2 now includes Icom PCR1000 operation**

## ❖ The Answer to our Question

Well, after using all the elegant, well thought-out, smoothly operating features of WorldStation v 4.2, the answer is clear: This program is easily worth its cost. In fact, in my opinion, WorldStation v4.2 is the only program that provides true, seamless, multi-radio shared support, both locally and via the Internet, while providing full remote control capability of a home-based radio.

So, our answer is that for software that is solidly designed, flawless in its operation, innovative in functions and features, has a short learning curve, and local and on-line detailed instruction and help, YES, it's worth buying!

WorldStation sets the bar high, but, if they can do it, other commercial software products should be judged by the same criteria. Even though I *love* freeware, sometimes you get what you actually pay for. I think you'll find that the case with WorldStation v4.2.

Keep looking for new radio freeware, but be ready to occasionally lay out cash for deserving commercial radio software. Be an informed and smart radio software consumer: Make sure the software is worth it *before* you buy. How? Simple: Keep reading this column...



# What's NEW

## Tell them you saw it in Monitoring Times

### Dayton Hamfest Equipment Releases

For many years now, the Dayton Hamfest is the place where radio equipment manufacturers promote their new products for the radio hobby community. At the 2008 Dayton event, there were two major radio equipment pieces promoted for the first time – the Icom IC-7200 transceiver and the Yaesu VX-8R handheld.

#### Icom IC-7200

The Icom IC-7200 is a robustly built amateur transceiver providing coverage of HF amateur bands plus 6 meters. Power is 100 watts. Features include DSP filtering, digital twin passband tuning, manual notch filter, keypad entry, dual VFOs, voice synthesizer, 201 memories, attenuator, RIT, scanning, 1 Hz tuning and more.



One of the most striking attributes of the IC-7200 is its construction. This is not an "ordinary" base station radio. It is an outdoor, EMCOMM-capable radio. Features such as the high-stability master oscillator, the gasketing around all the panels, and the 100 watts power output are perfect for those first responders sending E-Mail via an HF network from a USB-connected laptop.

Although the IC-7200 is not waterproof, extra design steps have been applied to the front panel buttons and knobs. This provides a measure of protection against water intrusion. There is even a USB port on the rear panel.

#### PUBLISHED SPECIFICATIONS (subject to change)

##### Frequency range :

Receive frequency coverage

0.030–60.000000 MHz

##### Transmit Frequency Coverage

160 meters 1.800–1.999999 MHz

80/75 meters 3.500–3.999999 MHz

60 meters 5.3305, 5.3465, 5.3665, 5.3715, 5.4035 MHz

40 meters 7.000–7.300000 MHz

30 meters 10.100–10.150000 MHz

20 meters 14.000–14.350000 MHz

17 meters 18.068–18.168000 MHz

15 meters 21.000–21.450000 MHz

12 meters 24.890–24.990000 MHz

10 meters 28.000–29.700000 MHz

6 meters 50.000–54.000000 MHz

Mode : USB, LSB, CW, RTTY (FSK), AM

Number of memory Channels :

201 Channels (199 regular, 2 scan edges)

Frequency resolution : 1 Hz

Frequency stability : Less than  $\pm 0.5$  ppm

Power supply requirement :

13.8V DC  $\pm 15\%$  (negative ground)

Current drain :

Transmit Max. power 22.0A;

Receive Max. audio 2.0A;

Stand-by 1.3A

Operating temp. range:

$-10^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$ ;

$+14^{\circ}\text{F}$  to  $+140^{\circ}\text{F}$

Antenna connector : SO-239 (50 $\Omega$ )

Dimensions :

241  $\times$  84  $\times$  281 mm (projections not included)

9 1/2  $\times$  3 1/2  $\times$  11 1/2 in

Weight (approx.) : 5.5 kg; 12.1 lb

You can see an Icom brochure online for this piece of equipment at [www.ab4oj.com/dl/ic7200br.pdf](http://www.ab4oj.com/dl/ic7200br.pdf)

#### Yaesu VX-8R HT

The Yaesu VX-8R HT provides a full 5 watts FM on 50/144/430 MHz plus 1.5 watts on 222 MHz. It supports Blue Tooth hands-free operation with the optional BU-1 and BH-1 or BH-2 accessories. There is also an optional GPS unit and antenna with loads of features. This radio supports APRS 1200/9600 bps data communication (B band only). Like the VX7R, the VX8R is submersible and meets IPX57 specifications (3 feet for minimum of 30 minutes).

A powerful 7.4 V 1100 mAh Lithium Ion battery is included. An optional 3 x AA battery cell case will be offered soon. This HT is small: only 2.36 x 3.74 x 0.92 inches (thinner than VX-7R). It supports simultaneous independent 2-signal dual receive function with both V + V or U + U. It has weather band receive with Weather Alert. A barometric sensor is included. You can even operate Amateur radio while receiving FM broadcasts!

The receive coverage is wider than VX-7R, with an independent AM/FM broadcast receiver circuit.

The dot matrix LCD display provides Memory tag up to a maximum of 16 characters. You even get a high-resolution Spectrum Analyzer with  $\pm 60$  channels indication with wave monitoring of received/modulated signal! And DCS and CTCSS encode and decode is included.

#### ANNOUNCED VX-8R FEATURES:

- Optional Bluetooth
- Optional GPS
- APRS 1200/9600 bps (B band only)
- CTCSS/DCS Encode & Decode
- Weather Receiving with Weather Alert
- Wideband Receive
- Dual Receive
- Submersible IPX57
- Dot Matrix LCD
- Hi-Resolution Spectrum Analyzer

Neither of these two devices has been type accepted by the Federal Communications Commission and may not be sold or leased, or be offered for sale or lease, until approval of the FCC has been obtained. Pricing information is not available until the units have been FCC type accepted.

### Domestic Broadcast Survey 10 Released

The *Danish Shortwave Listener's Club International*, an active club of worldwide radio listeners from 33 countries, has released its 10<sup>th</sup> edition of *Domestic Broadcast Survey*.

The 10<sup>th</sup> edition, edited by DSWCI Chairman, Anker Petersen, is divided into four parts. Part 1 covers all active shortwave stations broadcasting on 2300-5700 kHz. Part 2 includes Domestic stations on international shortwave bands above 5700 kHz, broadcasting to a domestic listening audience. Part 3 is all Active Clandestine shortwave stations, including schedules and identification information. Part 4 lists all the frequencies deleted between 2 and 30 MHz which have not been reported during the past five years, but which may possibly reappear.

As with past editions, the new *Survey* is based on sources that include DX bulletins, current

schedules, and actual monitoring from radio hobbyists. Listings are in an easy to follow by-frequency format, sorted by frequency, kW, country, station operating schedules, parallel frequencies, and operating program format. Active stations are noted as A (Regular), B (Irregular), C (Sporadic) or D (Likely Inactive).

The "Last Log" column is listed on the right side, and indicates the last month and year that the station was reported prior to the publication's deadline this year.

The 35-page edition is available by email in Adobe Acrobat PDF format (about 175 kB). A limited number are available in printed format. All buyers of the DBS-10 will be given a username and password to access the monthly updates on the tropical bands published as *Tropical Bands Monitor* on the club's website at [www.dswci.org](http://www.dswci.org). Similar data from 2005-2007 is available to anyone at [www.dswci.org/tbm](http://www.dswci.org/tbm).

Funds should be addressed to: Bent Nielsen-Treasurer, Egekerogen 14, DK 3500 Vaerloese, Denmark. Email edition: DKK 40.00 or USD 9.00; Euro 5.00 or GBP 4.00 or SEK 50.00 or 5 IRCs. Printed edition: DKK 80.00 or USD 17.00 or EUR 11.00 or GBP 8.00 or SEK 105.00 or 9 IRCs. Additional payment information for cash notes may be obtained at [www.dswci.org/](http://www.dswci.org/)

The *Domestic Broadcast Survey 10<sup>th</sup> edition* remains an excellent source for hobbyists who follow closely the changing world of shortwave radio. This fine publication has been a part of my reference library in printed and PDF format for many years and I highly recommend it to all. It is accurate, timely and valuable as a reference aid.

– Gayle Van Horn, W4GVH

Books and equipment for announcement or review should be sent to What's New, c/o Monitoring Times, 7540 Highway 64 West, Brasstown, NC 28902. Press releases may be faxed to 828-837-2216 or emailed to Larry Van Horn, [larryvanhorn@monitoringtimes.com](mailto:larryvanhorn@monitoringtimes.com)



# AR-ALPHA

## Communications Receiver



- Multi-mode unit capable of receiving AM (synchronous), ISB, RZ-SSB, USB, LSB, CW, WFM including FM stereo, NFM, APCO-25 digital, and TV in both NTSC and PAL formats
- 6-inch TFT color panel can display received video signals or depict spectrum activity over a wide choice of bandwidths including a "waterfall" function to show signal activity over a specified time period

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- Composite video output on the rear panel of the unit
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- CTCSS and DCS selectable squelch functions
- DTMF tone decode
- Built-in voice-inversion descrambling
- CW pitch control, AGC, AFC
- Auto-notch feature
- User selectable spectrum display function from 250 KHz through 10 MHz in 1 KHz increments. Above 10 MHz bandwidth, it can display 20 MHz, 50 MHz, 100 MHz or 1 GHz, but above 20 MHz bandwidth, no audio will be available
- Resolution bandwidth is also user-selectable in increments of 1 KHz, 4 KHz, 32 KHz, 64 KHz, and 128 KHz.
- Fast Fourier Transform (FFT)
- Rear panel connections include 12 VDC power, RS-232C, USB 2.0, I/Q output with 1 MHz bandwidth, two antenna ports (one SO-239 and one Type N) and up to four antennas may be selected through the receiver's controls with the optional AS5000 antenna relay selector.
- Use desktop or with 19" rack mount

**The AR-ALPHA redefines excellence in professional monitoring receivers. No wonder so many monitoring professionals including government, newsrooms, laboratories, military users and more, rely on AOR.**



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<http://americanbandscan.blogspot.com/> - by Doug Smith

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<http://mt-editor.blogspot.com/> - by Rachel Baughn

MT: FED FILES  
<http://mt-fedfiles.blogspot.com/> - by Chris Parriss

MT: MILCOM  
<http://mt-milcom.blogspot.com/> - by Larry Van Horn

Larry's Monitoring Post  
<http://monitor-post.blogspot.com/> - by Larry Van Horn

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